Montana Outdoors

July / August 2003

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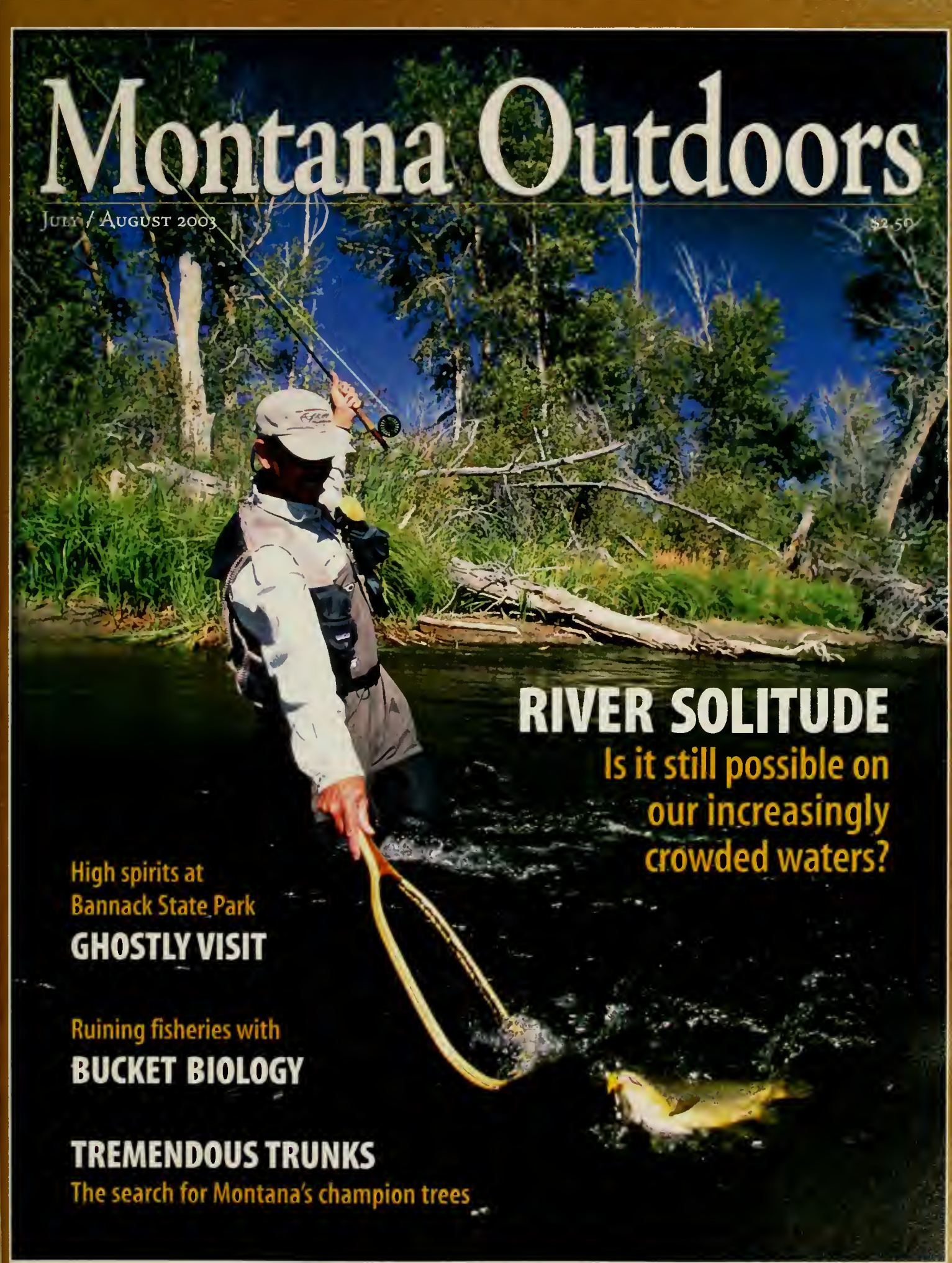

RIVER SOLITUDE

Is it still possible on our increasingly crowded waters?

High spirits at Bannack State Park

GHOSTLY VISIT

Ruining fisheries with

BUCKET BIOLOGY

TREMENDOUS TRUNKS

The search for Montana's champion trees

SHOP CLOSED: A half-century ago, the town of Bannack was donated to the state, which has since preserved its stores, hotels, saloons, and (some say) spirits. Learn more about the haunted ghost town state park on page 20. Photo by Tim Egan.

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Montana Outdoors

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COVER PHOTO: An angler nets a big brown on the Beaverhead River, at the center of a regulations controversy. For more on Montana's current river conflicts, see our story on page 6. Photo by Brian O'Keefe.

To Cascade, not Craig

Great May/June issue, especially the article on the Missouri River trout fishery. One correction, however. The article states there's a three-fish limit on the Missouri from the Dearborn River upstream to Craig. The three-fish limit actually extends from the Dearborn River downstream roughly 20 miles to Cascade.

Steve Leathe
FWP Regional Fisheries Manager
Great Falls

Editor replies: *That was our error, not the writer's. We apologize to anglers who may have been confused by the mistake.*

54 tree rings ago

My wife, Jean, took this picture of me in 1949 at Fish Creek when we were going to the University of Montana. It's listed as the state's largest ponderosa pine. I worked for the Montana Fish and Game Department for a while before moving on to the U.S. Fish and Wildlife Service, where for 18 years I was chief of the Patuxent Bird Banding Laboratory.

George Jonkel
Fountain, Florida

Editor replies: *That massive ponderosa pine is now even bigger than when you stood there. For an update on the 194-foot-tall specimen and Montana's other champion trees, see our story on page 11.*

Montana's most-native wildlife species?

I was pleased to see mention of wild horses in recent issues of *Montana Outdoors*. Horses spent millions of years evolving in North America and have only been absent several thousand years due to some post–ice age calamity that wiped out most of the continent's big game diversity. Judging from their success in recolonizing their old ecological niches, I'd say they belong here just as much as the wild horses that are presently being reintroduced to Mongolia, where they were wiped out much more recently. I imagine that if mustangs had a trophy rack like deer or elk, they'd be considered a game species and be much more popular with hunters and wildlife biologists.

Bill Cody
Camillus, New York

Troth or consequences

In the May/June issue you pictured a fisherman on page 31 of the article "Keeping the Ribbon Blue." It might be nice if you gave some credit to the gentleman, who, by all rights, is probably the most well-known fisherman in the state and one of the top experts in all of North America, Al Troth, of Dillon, creator of the Elk Hair Caddis fly. I am certain that Al would not take issue with this omission, but there are some basic courtesies when using someone else's picture to give credence to your magazine. 'Nuff said.

On the positive side, your magazine is absolutely beautiful and tells and illustrates the stories very well. It should be mandatory reading material for all of those who call Montana home.

Hal Webster
Fort Benton

Editor replies: *Mr. Troth certainly deserves recognition for his contributions to the art of fly tying, not to mention photography (see his images in this issue, pages 6 and 22). However, our policy is to not identify people in a photo unless their identity is relevant to the article in which it appears.*

Subsidies aren't charity

I've been in and out of Montana's river system, both as a ranch hand and as a fisherman, since I was a kid in the 1960s. I agree with Duane Phinney ("Letters," March/April issue) that Montana's traditional concept of public ownership of waterways below the high water mark successfully ensures multiple use of the resource. However, I take exception to his characterization of government payments to agriculture as charity. This country has had a cheap food policy in place for generations. Government price supports and disaster payments should not be seen as any different from government subsidies of highways, airports, or a multitude of other social and infrastructure programs. The expenditures for the federal Conservation Reserve Program, for example, will benefit our country for years to come and are a cost we pay in exchange for growers producing food at low prices. The fact that we do have open spaces left with habitat and associated wildlife stands as a living tribute to the millions of agriculturalists who preserved it for us.

Lloyd L. Wilson III
Centerville, Kansas

"Actually, I prefer to think of this as a 'gated community.'"

Q. *How do you tell a cutthroat trout from a rainbow trout?*

A. The most dependable way, says Mark Lere, FWP Fisheries Division Habitat Restoration Program officer, is to look for the red or orange "cut throat" slash on each side of the lower jaw. Another fairly reliable indicator is that cutthroats have black spots that are more dense toward the rear of the body, near the rail. The rainbow trout's black spots are more uniformly spread out along the body, Lere says.

Color illustrations of rainbow and cutthroat trout can be found in Montana's fishing regulations booklet.

Q. *What are the odds of drawing a bighorn sheep hunting permit?*

A. Better than those for winning the state lottery, though not by much. Hank Worsech, chief of FWP's License Bureau, says your chances depend on what district you put in for, whether you're a resident or not, and how many other hunters are applying. "In some places, the odds are less than 1 in 100 most years," he says. "But in other districts, where access is real remote, there aren't many sheep, or we allow ewe hunting only, you might have a 50:50 chance or better. There's no pat answer; it depends on a lot of different factors."

Q. *The Wolverine character in the X-Men movies and comic books has foot-long, retractable, razor-sharp claws. What about real wolverines?*

A. According to Brian Giddings, FWP furbearer coordinator, wolverines do have sharp claws, but they aren't razor sharp, can't be drawn in like a cat's, and are only about 1 inch long. Unlike the fictional superhero character, real wolverines don't use their claws to slash and kill enemies, either. "They use them mainly to excavate ground squirrels, marmots, and pikas, and to dig through snow to get to elk carcasses in the winter," Giddings says.

? *Wonder about some part of Montana's natural world? E-mail us at: tdickson@state.mt.us*

ILLUSTRATIONS BY JEFF TOLBERT

OUR POINT OF VIEW

JEFF HAGENER | *Director of Montana Fish, Wildlife & Parks*

What we can do about elk impacts

AT THE RECENT LEGISLATIVE SESSION, several lawmakers told me they don't believe FWP does enough to address the problem of expanding wildlife populations. In particular, they said, some of their constituents are upset that growing numbers of elk are eating their grass, hay, or corn. Landowner groups and legislators representing their interests maintain that FWP isn't responding to complaints and that landowners shouldn't have to feed the public's wildlife without compensation.

I'm sympathetic to those concerns. Over the years I've seen what a herd of elk can do to cornfields and haystacks. I also know that elk numbers are increasing in some areas of Montana and are causing more impacts than in years past.

The big question is whether FWP is adequately responding to this problem. Our point of view is that we are, as much as we can.

We respond to every wildlife damage complaint we get, without exception. We'll meet with the landowner, survey the situation, and offer solutions. For instance, we might open up a hunting season earlier than usual to reduce elk numbers in that particular area. Or hire herders to chase elk off the private property onto public land in the spring and summer. Or pay to fence haystacks on private land to keep elk out.

However, we don't always respond in ways every landowner wants. Some ask for cash reimbursements for crop losses, and others request free hunting licenses. FWP has no legal authority to use hunters' license dollars to pay landowners for grass or crops consumed by wildlife, and free licenses don't reduce or prevent wildlife impacts.

Some landowners who insist that FWP "do something" about game damage won't open their property to public hunting. Hunting is the primary tool we use to control wildlife populations, and, by law, we can provide damage assistance only to landowners who allow public hunting on their property. It's not fair for those who shut out hunters to then expect hunters to foot the bill for their depredation problems.

Managing a species as big and mobile as the elk is expensive, labor-intensive, and often involves factors beyond our control. For example, during a mild fall and winter, elk may stay up in the high country beyond the reach of hunters. And often it's impossible to reduce elk numbers in areas where landowners don't allow public hunting and the elk hole up in these private "refuges." Because one landowner's management decisions can affect neighbors miles away, it is essential for all landowners in an area to work together, and with this agency, to address elk issues that affect everyone.

Elk are beautiful, majestic animals that add greatly to this state. Most landowners I talk to agree. But like deer and antelope, elk cause problems in some places. Part of our mission is to help solve those problems, and we're doing that throughout Montana. But we can't reduce wildlife impacts without the cooperation of those seeking our assistance.

M. Jeff Hagener

FWP receives much legislative interest during 2003 session

FWP staff members tracked more than 200 different bills or bill drafts affecting Montana's fish, wildlife, and state parks management during the 2003 legislative session. "That's more than anyone here can ever remember having to follow," says FWP director, Jeff Hagener.

TRAVEL MONTANA

Montana lawmakers prepared 200-plus bills affecting FWP.

According to Hagener, much of the voluminous legislation was introduced due to misinformation about FWP programs and what the agency legally can and can't do to manage fish, wildlife, and parks.

"A lot of bills really didn't need to be there in the first place if people had known more about the department and its programs and current authorities," he says.

Hagener adds that the session highlighted the need for FWP to do more to tell citizens and lawmakers about its mission, programs, and issues.

"When we would meet with legislators and explain that what they were proposing just wasn't practical, a number of them dropped their bill's introduction or agreed to amend or table their bill," he says.

WHAT'S NEW

Many bills did survive, however, often with FWP support. Here is what the final 2003 legislation changed for anglers, hunters, and parks users:

• The special state lands access license was eliminated. Beginning in 2004, a $2.25 fee will be added to all resident and nonresident hunting, fishing, and trapping licenses to allow access on most state lands. (Twenty-five cents of that will help pay for county rescue operations for lost hunters, anglers, or trappers.)

• Also beginning next year, a $4 assessment will be added to state vehicle license plate fees (there is an option of not paying). Your license plate will then work as a parks admission sticker. Nonresidents will still need to pay a daily fee or buy a parks passport, good for entry to all parks for one year.

• Starting this fall, the youth combination license will be free to first-time resident hunting license buyers age 12 to 17.

• There is now a new ten-day nonresident fishing license available for $43.50—which is $16.50 less than a full-season license.

• FWP was given authority to auction a special elk and deer license—as it does for moose and bighorn sheep—to raise funds for habitat.

• FWP can now issue a second antlerless elk license to residents and nonresidents in areas that have too many elk.

• This fall, Montanans will vote on whether to amend the state's constitution to include language that acknowledges the privilege (though not the right) to hunt and fish.

• Beginning this October 1, anyone born after January 1, 1985, must have completed a hunter education course in Montana or another state before buying a hunting license.

• The FWP Commission was granted authority to use hunting seasons to manage the growing number of bison that leave Yellowstone National Park. The commission has taken no action so far, but if a hunt were required, it would first undergo an environmental assessment.

• FWP was given authority to regulate the importation, sale, and possession of exotic wildlife to protect people, livestock, and native species.

DIDN'T PASS

The following bills affecting FWP were widely publicized during the session but didn't pass:

• Several bills would have made it harder for game wardens to enforce laws that protect wildlife and public safety. One called for transferring game warden funds and responsibili-

GARYKRAMER.NET

GENTLY: Preparing to release an arctic grayling.

HOW TO LET 'EM GO

A growing number of Montana waters have special fishing regulations that require anglers to release some sizes or species of fish. And, increasingly, more anglers are letting fish go whether the law says to or not.

But a released fish isn't necessarily a live fish. Still stressed by drought, and often caught repeatedly by a growing number of anglers, trout and other species need special care when being caught and released. Some guidelines:

- Play and land a fish quickly. A prolonged struggle places too much stress on a fish and causes a build-up of harmful lactic acids.
- Handle the fish gently and keep it in the water as much as possible. Wet your hands before touching the fish so you don't remove its protective slime.
- If possible, unhook the fish without lifting it from the water. Use a forceps or needlenose pliers to quickly remove hooks.
- Consider using barbless hooks to make it easier to unhook fish.
- If a hook is imbedded deeply, cut the line. Fish have strong digestive acids that will dissolve metal. Studies have shown that fish released in this manner have a higher survival rate than fish that have hooks torn from their throat or stomach.
- Release fish into calm water. A tired fish placed in rapids can die by tumbling downstream into rocks. Hold the fish lightly until it swims away on its own.
- When lifting a fish for a photograph or just to admire it for a moment, don't squeeze hard or hold it by the gills.

ties to county sheriff offices.
• One bill would have allowed landowners to herd elk and other wildlife off their land without having to consider the effects of that activity on their neighbors.
• Another bill would have prohibited FWP from taking part in cooperative wildlife management plans that include habitat management.
• Several bills would have compensated alternative livestock producers for the elk and the value of their business lost due to restrictions imposed by Initiative 143, passed by Montana voters in 2000.
• One bill would have required FWP to re-prove its water rights each time a new landownet filed for a water right on a river or stream. Municipalities, industry, and landowners would not have had the same requirement.
• Several bills would have eliminated or weakened FWP's ability to buy conservation easements.

Montana keeps watch on Arizona nonresident lawsuit

Montana and other western states might have trouble charging nonresidents more than residents for hunting licenses, or restricting the number of nonresident licenses issued, if federal courts continue to tule as they have recently.

In August 2002, the 9th U.S. Circuit Court of Appeals (which covers western states including Montana) ruled that Arizona needs to show a "compelling state interest" for providing only 10 percent of its deer and elk tags to nonresidents and charging them more for those licenses than residents.

According to FWP legal council Bob Lane, the appeals court gave two reasons for applying the interstate commerce clause of the U.S. Constitution to the hunting regulations and fees. "One, because the plaintiffs argued that they planned to sell trophy elk mounts and hides, which the court considered as interstate trade in animal parts, and two, because the nonresidents were engaged in interstate commerce when they traveled to Arizona," Lane explains.

Arizona argued unsuccessfully that nonresident hunting is recreation, not commerce. The court acknowledged that some discrimination against nonresidents might be justifiable in order to conserve wildlife and ensure recreational hunting for residents. But it said the higher fees and limited licenses need to be "the least discriminatory alternative for accomplishing wildlife management goals."

KERRY T. NICKOU

An interstate commerce product readies to drink.

Arizona appealed to the U.S. Supreme Court, which declined to consider the case. "That doesn't mean [the Supreme Court] wasn't interested, just not interested now," says Lane.

The case was then sent back to federal district court in Arizona. The state is arguing that its regulations do meet the "compelling state interest" test.

"Arizona has a tough task to convince the court that its regulations restricting nonresidents complies with the commerce clause," Lane says.

In 1975, Montana won a U.S. Supreme Court case (*Baldwin vs. the State of Montana*) that alleged the price differential between resident and nonresident licenses was discriminatory. The high court ruled that states can deny certain privileges (but not rights) with a reasonable rationale for that discrimination.

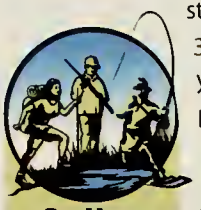
The ruling was critical for Montana and other sparsely populated western states, where higher nonresident hunting and fishing license fees make up the bulk of conservation agency budgets.

Lane is not sure how the Arizona decision relates to the Baldwin case.

"We plan to wait and see what happens with the next court ruling," says Lane. "The best thing would be for this to get to the Supreme Court so the issue can be resolved."

Hunting and fishing licenses now available on the Internet

Hunters, anglers, and parks visitors have been wanting this for years. Now, Montana hunting and fishing licenses and state parks passports are finally available online:



1. Begin by going to fwp.state.mt.us. Click the "Online Licensing" icon and follow the instructions.
2. You'll need a MasterCard or Visa credit card. (A processing fee of $1.25 plus 2 percent of the purchase price will be added to the total.)
• Note to Montana residents: Before buying hunting or fishing licenses online, you must first purchase your $4 Montana Conservation License *in person* at any FWP license provider. There, you'll also need to show your Montana driver's license or state photo I.D. card.
3. After you make your online licenses purchase, FWP will mail you durable, permanent versions. Meanwhile, you can print temporary licenses from your home computer and use them to bird hunt, fish, or visit state parks, with these exceptions: Licenses that double as carcass tags—such as those for deer, elk, and black bear—can't be printed from home (in other words, you may not buy these licenses online and immediately go hunting).

Allow FWP roughly ten days to mail permanent licenses and carcass tags.

Cross Curre

DONNIE SEXTON/TRAVEL MONTANA

PAUL F. UPDIKE

LAST YEAR WAS THE WORST EVER for Tom Harman's fly shop in Sheridan. Harman, who has owned the business since 1990, used to run some 200 fishing trips each year on the nearby Ruby, Madison, Beaverhead, and Big Hole Rivers.

"Last year I did 15," he says, "and my gross sales were just a third of what they were four or five years ago."

While acknowledging the likely effects of drought, a faltering national economy, and the travel scare after 9/11, Harman believes the main cause of his sales slump was a new regulation that restricted outfitters and nonresident anglers from floating certain portions of the Beaverhead and Big Hole Rivers some days during the summer.

"The rules themselves aren't that big a deal," he says, "but the way they got reported nationally just about killed us around here."

Not everyone, however, is soured on the river regulation. Butte angler Steve Luebeck says the restrictions have reduced crowding and made trout fishing far more enjoyable.

"In the late 1990s, I'd go to the Big Hole and there'd be five boats upstream of me and five boats downstream," says Luebeck, a Trout Unlimited member who has fished the river for three decades. "Commercial use was growing every year. For the regular Montana angler, fishing just wasn't fun anymore."

Harman and Luebeck are two of many outfitters, anglers, floaters, and landowners embroiled in growing conflicts over Montana river use. From the South Fork Flathead in the northwest to the Bighorn in the southeast, an increasing number of residents and nonresidents are taking to Montana's rivers. But as one retired state fisheries biologist puts it, "We aren't making any new ones." The crowding that results touches on a wide range of issues, such as

AL TROTH

STANDING ROOM ONLY: Fishing pressure on the Beaverhead (left), the Big Hole, and other Montana rivers grew steadily throughout the 1990s. "Fishing just wasn't fun anymore," says one Butte angler.

nts

Montana struggles to accommodate the growing number of river anglers, kayakers, and floaters

BY TOM DICKSON

MIKE GURNETT/MONTANA FWP

JEFF HENRY/ROCHEJAUNE PICTURES

CRAIG & LIZ LARCOM

private property rights and the public's rights to public resources. The main conflicts center on crowded angling conditions, but there's also turbulence surrounding the growing number of whitewater floaters, kayakers, and inner-tubers.

Caught in the conflicting currents is an agency traditionally responsible for managing fish and wildlife, not people. Over the past decade, FWP has been asked to take on the relatively new role of managing river users. With a work force trained in biology, not sociology, the agency ofren finds itself ill-equipped to handle angry anglers, floaters, outfitrers, and landowners.

"We're making critical decisions about river use withour any clear policy," says Charlie Sperry, FWP river recreation management specialist. "We've gone from one river conflict to the next, without taking a step back to look at the issue from a broader perspective."

That has begun to change. Montana FWP recently established a citizen's river advisory council whose task is to take a comprehensive look at river issues. The group is developing statewide guidelines the agency can use whenever it needs to manage river conflicts.

"I look at this as part of the agency's ongoing evolution," says Sperry, who coordinates the council. "What we're doing is learning from the Big Hole, the Beaverhead, and other rivers to come up with some overarching principles that apply to all rivers and can help us manage specific rivers as the need comes up."

BEAVERHEAD AND BIG HOLE CONTROVERSY

Conflicts over Montana's 15,000 miles of coldwater streams and rivers have a long history. From the beginning of statehood until today, Montanans have wrangled over water appropriation rights. Throughout the second half of the 20th century, anglers and ranchers disagreed over river flows and access. And since the late-1950s, the state has occasionally intervened to spread out fishing pressure on popular fishing rivers.

One of the most contentious disagreements currently underway centers on the Beaverhead and Big Hole Rivers, in the state's southwestern corner. Nationally renowned, both rivers have long attracted anglers, especially on midsummer weekends. But for decades, crowding never reached intolerable levels, and anglers who wanted to fish in solitude could find ways or places to do so.

That changed in the mid-1990s. A growing national interest in fly fishing (heightened by the release of the movie *A River Runs Through It* in 1992), along with the whirling disease scare on the nearby Madison River, led to an increase in outfitters and national attention on the Beaverhead and Big Hole. Angling activity on the rivers peaked in 1997, when high water on many other Montana rivers sent anglers flocking to the Beaverhead, which has its flows moderared by Clark Canyon Reservoir upstream. Fishing pressure that year was over twice what it was in 1995, increasing from 17,000 angler days to 40,000. The number of anglers also grew on the Big Hole, and the number of licensed outfitters on the two rivers grew during that time from 140 to 184.

WADERS VS. BOATERS: Many river complaints come from anglers afoot (below). Traditionally, waders walk from spot to spot encountering few other anglers along the way. Montana's increasing number of drift boats (right) have begun to change that. Anglers in boats can cover miles of water each day, hopscotching from one productive spot to the next. Wading anglers say the boats spook fish and disrupt their solitude. Boaters argue they have as much right to the rivers as anyone else.

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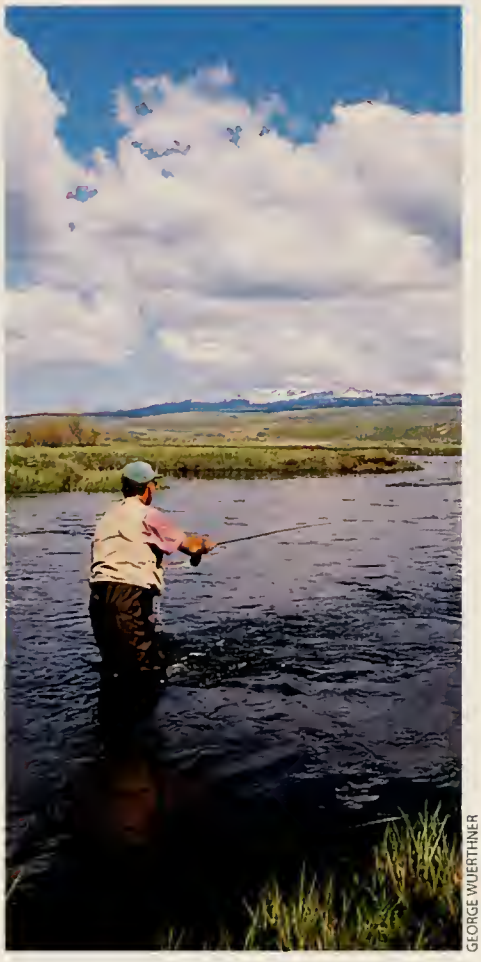


GEORGE WUERTHNER

"We had more and more anglers and outfitters tell us that things were just getting too crowded," says Bruce Rich, regional fisheries manager at Bozeman.

Not all anglers and outfitters agree there was a problem ("I think the crowding problem there was overstated," says fishing guide Eric Troth of Dillon). But enough did, and pressure on FWP and legislators to reduce crowding on the two rivers mounted steadily. In 1999, the Montana legislature responded by authorizing the FWP Commission to regulate conflicts on the Beaverhead, Big Hole, and other Montana rivers. Over the next two years, the commission decided to put a moratorium on new Beaverhead and Big Hole outfitters. Even more controversial, it decided to close float fishing to outfitters and nonresident anglers on some stretches of the two rivers on certain days.

THE NONRESIDENT ISSUE

Regulations restricting recreational use and outfitters on Montana rivers weren't exactly new. In 1959, 1967, and 1988, float fishing was temporarily closed on parts of the Madison River to reduce crowding. And in the early 1990s, FWP began regulating recreational floating on the increasingly popular Smith River.

But the new Beaverhead and Big Hole rule marked the first time nonresident anglers were singled out. And that seemed to hit a nerve. In the eyes of some national media, Montana had now "thrown up roadblocks to outsiders," as *Los Angeles Times* columnist John Balzar wrote in 2001.

FWP officials defended the new regulation by pointing out that the department wasn't closing the rivers to nonresidents. Wading was still allowed everywhere and every day, and floating was restricted on only portions of the rivers. The intent of the regulation, they maintained, was to manage crowding and spread out use so there would be fewer anglers bumping into each other.

"We're trying to maintain a quality fishing experience for both resident and nonresident anglers," says Jeff Hagener, FWP director. "Some people may have misinterpreted the rule to mean nonresidents aren't welcome in Montana, but they should know that's simply not true."

Some national press applauded the agency's actions. *Fly Fisherman* opined that the Beaverhead and Big Hole rule may be "...the most creative plan to regulate stressful competitive fishing pressure on public waters ever conceived." The magazine called on other states to review the plan as a possible model for solving river crowding problems.

Nevertheless, the myth that Montana had "marked out some of the finest public fishing water for 'locals only,'" as Balzar wrote, quickly spread by Internet and news reports throughout fly-fishing circles nationwide. Misinformation was rampant.

"Every week last year I'd have at least one nonresident stop in and tell me they thought they were no longer allowed on the Beaverhead or Big Hole," says Harman.

That may have hurt many bottom lines. Businesses catering to the Beaverhead and Big Hole trade reported far fewer customers in 2001 and 2002, and most have blamed the angling restrictions. FWP officials acknowledge that the new rules may have played a role, but they note that many other factors—the country's economic downturn, less travel after the World Trade Center attack, and especially a lingering drought that has kept water levels in both rivers extremely low—likely contributed more to the sales declines.

They also point out that most anglers and even some local outfitters support the regulation. A department survey found that supporters of the rule outnumbered detractors three to one. And when the FWP Commission recently sought comments on

Tom Dickson is editor of Montana Outdoors.

whether or not to continue the rule until 2005, the vote was 444 comments for the rule versus 92 against.

"Local businesses have taken a hit," says Jerry Kustich, a fishing author and rod builder in Twin Bridges, "but from the standpoint of providing an opportunity for the average Joe to go fishing and not compete with the professionals, the regulations have really been a success."

INNER TUBES, RAFTS, AND KAYAKS, TOO

The Beaverhead and Big Hole are by no means the only Montana rivers where values and users clash. Anglers say the growing influx of inner-tubers and picnickers on the Blackfoot River squeezes them out of traditional fishing spots. And on the upper Missouri, where fishing pressure nearly doubled from 1991 to 2001, drift boats wait in line some days to gain access to particularly productive riffles.

According to Larry Clark, a longtime rancher in the Rock Creek Valley, 30 miles southeast of Missoula, the rapid growth in boat traffic on that famous fishing stream has made life tough for nearby residents.

"During the salmonfly hatch, the river is bank-to-bank rafts, and the local anglers here have no place to fish," Clark says. "It's just ridiculous." Car and truck traffic along the dirt road that parallels the stream gets so bad in June, he adds, that "many a time we have to take to the ditch to avoid oncoming vehicles."

On central Montana's Smith River, crowding, trespassing, and littering grew so bad that by the early 1990s FWP began requiring a fee and limiting group size and number during the peak midsummer season. So crowded has the Bighorn River become, says FWP biologist Ken Frazer, that "it appears many Montana residents who used to fish here no longer do so from May through August."

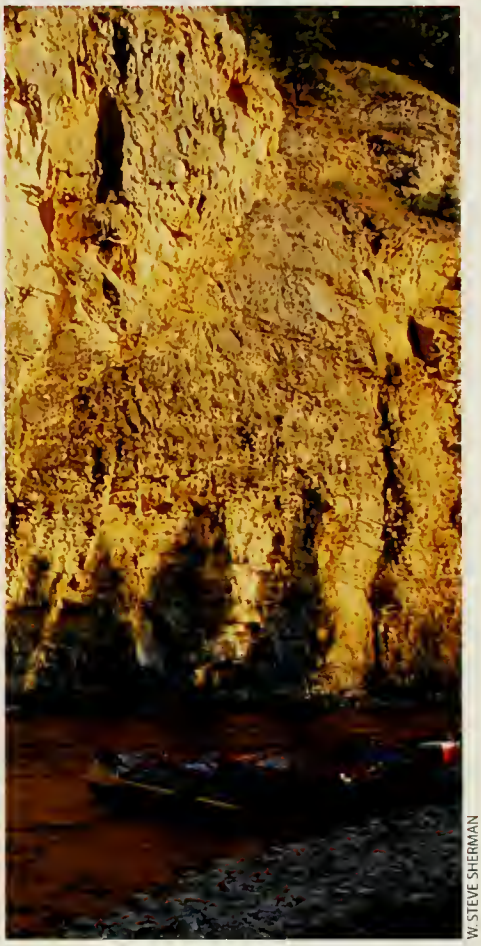
Even kayakers and rafters are feeling hemmed in. Julia Page, who for 21 years has owned a commercial rafting operation, says growing use on the South Fork Flathead, Yellowstone, and Gallatin Rivers frustrates those accustomed to having the water to themselves.

"I and everyone else out there would love to be the only one out on the river," she says. "But that's just not possible anymore."

Finding out what still is possible has been the goal of the Montana River Recreation Advisory Council, formed in 2002. Consisting of Page, Clark, Luebeck, and 19 other members appointed by FWP to represent outfitters, landowners, anglers, boaters, and legislators, the council has met monthly to learn about and discuss river issues. In midsummer 2003, council members were scheduled to provide the FWP Commission with a decisionmaking framework, to help commissioners determine if use on particular rivers needs to be managed, and a set of guiding principles for what type of management would be applied.

The council's assignment was not to develop rigid solutions that would be applied to every river and every situation, notes Page. "Instead, we've developed a framework for what FWP might consider when it grapples with crowding on various rivers," she says.

According to Sperry, one big value of the council's recommendations is that they will make it easier for FWP to identify the best ways to manage the state's many different rivers and river issues. "The suggested



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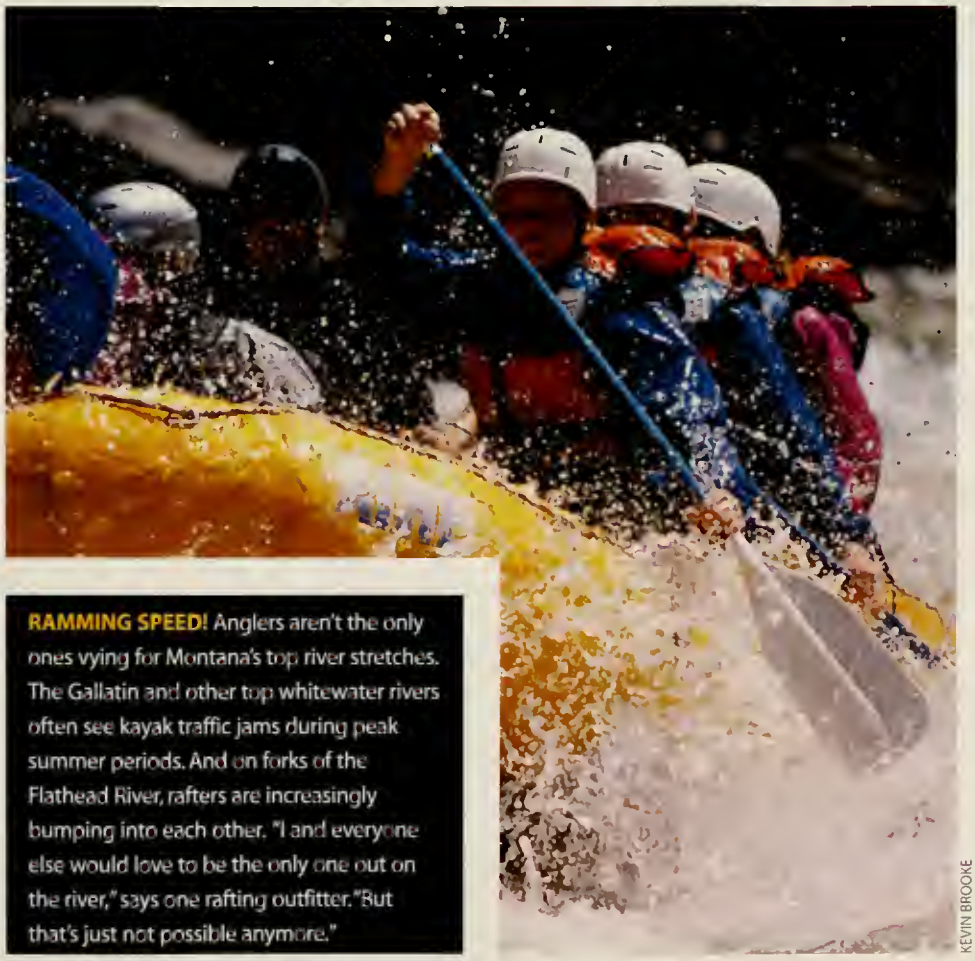

KEVIN BROOKE

RAMMING SPEED! Anglers aren't the only ones vying for Montana's top river stretches. The Gallatin and other top whitewater rivers often see kayak traffic jams during peak summer periods. And on forks of the Flathead River, rafters are increasingly bumping into each other. "I and everyone else would love to be the only one out on the river," says one rafting outfitter. "But that's just not possible anymore."

MONTANA OUTDOORS

THE BIG PICTURE: Charlie Sperry, FWP river recreation management specialist, says Montana's new River Recreation Advisory Council has taken a step back from individual river conflicts to look at river issues from a broad, statewide perspective. "Taking a big picture approach like this is unheard of in other western states," he says.

guidelines will help us find the tight management tools for various rivers so we don't end up using inappropriate measures where they really aren't needed," he says.

Sperry previously worked in Idaho coordinating a citizen's council that resolved conflicts over the famous Henry's Fork. He notes that Montana is currently the only western state taking a comprehensive look at its river recreation issues.

"That's unheard of elsewhere," Sperry says. "Other states are still scrambling to address issues one river at a time, and they're finding out that in many cases it just isn't working."

That doesn't mean the task in Montana is an easy one. Though they have worked on reaching consensus, river council members represent often-conflicting values, such as one person's right to make a living off a river versus another's right to fish there unbothered.

"There's a strong feeling among Montana sportsmen that they want to retain access to their public resource and see the quality of their experience preserved," says Mike Whittington, a member of the Billings Rod and Gun Club who represents Montana anglers on the council.

That strong feeling, however, is what concerns council member Robin Cunningham, executive director of the Fishing Outfitters Association of Montana. "Our association is real concerned that there is often a perception of a problem on rivers not indicated by substantiated data," he says.

ENOUGH COMMON INTEREST?

Though the division between those representing commercial and noncommercial interests, waders and boaters, and anglers and rafters may appear broad, there could be enough common interest in protecting Montana's rivers to bridge the gaps.

Cunningham says that "if you scratch an outfitter, there's a local Montana angler underneath." And though Luebeck maintains that rivers should be managed just as logging, mining, and other industries that use public resources are managed, he concedes "rivers can support commercial activity, and that commercial activity is good for Montana."

Such accommodating sentiments offer hope that Montana's river issues can be resolved after all. When strongly held values clash, no progress is possible until those on all sides acknowledge some validity to opposing viewpoints.

That holds even more true as the number of viewpoints grows. Since 1980, Montana's population has climbed nearly 25 percent, from 800,000 to nearly one million residents, and nonresident visitation has grown at an even faster rate. As recreational pressure on rivers increases, the days of fishing, boating, or floating solitude on many waters may no longer be possible—at least on midsummer weekends. But FWP staff and others trying to resolve river conflicts believe there are still ways for all users to find from the state's abundant and diverse rivers most of what they seek.

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STILL ENOUGH TO GO AROUND? As the state's population and tourist visitation continue to climb, the days of fishing solitude may be gone. But with more than 15,000 miles of coldwater streams and rivers, Montana still has a chance to manage its waters in ways that allow users most of what they seek.

MONTANA'S TROPHY TREES

BY JAMES HAGENGRUBER
PHOTOGRAPHY BY TOM BAUER

IMAGINE BACKPACKING in the Beartooths without being able to pitch a tent in a grove of tall firs, paddling the Yellowstone with no audience of majestic cottonwoods, or taking a Bitterroot Valley hike on a fall afternoon without passing through a mature stand of golden-leafed aspen.

Like waterfalls, royal elk, and rare wildflowers, giant trees add magic to the state's outdoors.

Finding and honoring the grandest of these forest monarchs is the goal of several tree proponents who have located and recorded the largest of each of Montana's 40-some tree species in a champion tree registry. The species range from a western red cedar stout enough that it would require six adults to wrap their arms around its base, to a western serviceberry with a trunk no wider than your wrist.

HIGH CHAIR: Dwarfed by his stump seat, retired state forester Mark Lewing sits on the Montana champion plains cottonwood, in Ravalli County.

Records of the nation's largest trees have been kept since 1940 by American Forests, a nonprofit conservation group. Helen Smith, a fire ecologist at the U.S. Forest Service Fire Science Laboratory in Missoula, maintains the organization's champion tree list for Montana. Smith is also co-discoverer of the 153-foot-tall western larch, one of the state's two national champions.

"They're awe-inspiring," Smith says of champion trees. "When you're standing at the base of one, to think that it survived 1,000 years or longer, it's very humbling."

Champion trees are sized on a point system that combines circumference, diameter, height, and crown spread. Montana's highest-scoring tree, a western red cedar, racked up 555 points. The national champ, a coast redwood in California that has an 85-foot circumference and rises 369 feet from the ground, tops out at 1,312 points. Montana's smallest biggest tree, a western serviceberry with a 10-inch circumference, has just 28 points.

Montana's other national champion tree, though yet to be officially recognized as such, sprouted decades ago in the Kootenai National Forest. It is a quaking aspen that stands 142 feet tall and has a trunk diameter of 30 inches.

Hunting and angling is steeped in a tradition of recording the biggest of various fish and wildlife species. States keep records, as do organizations such as the Boone and Crocket Club and the International Game Fish Association. But few people ogle photos of giant mountain hemlock or take a week of vacation to pursue a new record blue elderberry. Tree trophies, it turns out, don't have a big fan base.

In fact, of Montana's 38 state tree records, nearly half were nominated by just three people. And seven species have never been nominated at all (know of, or even heard of, a cascade mountain ash or a Columbia hawthorn?).

LARGE LARCH: USFS forest ranger Tim Love stands next to America's largest western larch, which grows near Seeley Lake. The tree rises 153 feet from the ground and is 264 inches around at the base.

Most of Montana's giants live in the soggy northwestern region, the workplace of U.S. Forest Service forest technician Alan Lane, who has registered six records, including the subalpine fir, western white pine, and quaking aspen.

"I found most of them when I was doing stand exams for the Forest Service," he says. "I was running into big trees all the time."

With seven nominations to his name, Martin Flanagan is another titan of Montana's champion tree registry. A rancher, nurseryman, aquaculturist, and former outfitter, Flanagan lives in—where else?—Big Timber, a town named for the giant cottonwoods that line the nearby Yellowstone River. Flanagan believes some of those trees are over 200 years old, which means they would have lined the banks as Capt. William Clark and his crew floated past two centuries ago.

Flanagan is a man obsessed with trees and shrubs. On a wall in his home is a map of the upper Rocky Mountain states, marked with more than two dozen red dots showing the location of champion trees. His yard is thick with trees, and one section is set aside as a sanctuary for rescued lilacs. When an old home in the area is razed, Flanagan tries to dig up any surrounding shrubs. Each bloom is different, he says. Many were carried across the Great Plains in covered wagons and

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James Hagengruber is a journalist who lives in Billings. Photojournalist Tom Bauer lives in Missoula.

have continued blooming long after dust bowls and depressions have pushed away the people.

"Lilacs, rhubarb, and yellow roses are all that's left of some of the old places," Flanagan said. "They're living pieces of our history."

Most of the seven state champion records claimed by Flanagan are located in Sweet Grass County and are not what anyone would consider majestic. But they are extraordinary examples of tiny species. The peachleaf willow he nominated three years ago, for example, stands just 20 feet tall. Nonetheless, that specimen would tower over its peers anywhere in Montana.

The champion tree registry is a good way of inspiring people to take an interest in the state's forests, Flanagan says. It also has the power to highlight some of the state's lesser-known native species.

Flanagan makes part of his living selling trees native to Montana. He was recently hired to plant Rocky Mountain maple, Rocky Mountain juniper, and Rocky Mountain ash at the National Museum of Forest Service History, a nonprofit, privately owned museum under construction on a 36-acre site near Missoula. These species are "virtually unheard of at nurseries," says Flanagan, who collects the specimens on public lands near his home.

Flanagan also recently founded the for-profit Montana Champion Tree Project, which aims to not only protect big trees, but to trademark and sell their genetic copies. In August 2001, Flanagan worked with Lane, from the U.S. Forest Service, to cut buds from the state and national champion quaking aspen in northwestern Montana. The buds have been grafted onto aspen stock—much in the same way fruit trees are grafted—and are being grown at an Oregon nursery. Flanagan hopes to begin selling the young champions soon.

Flanagan knows that the environment plays a strong role in the health of any organism, but he also believes in the power of good genes. Just as ranchers use the best bulls to improve their herd, Flanagan believes his champion tree clones will grow taller and stronger than the average tree.

"In no way can we prove our trees are superior," Flanagan says. "But common sense tells us they should be."

Flanagan would like to see more communities establish "living libraries" of champion tree clones, where the specimens could be nurtured by experts and appreciated by the public. "The trees, they're our only living link to our ancient past," Flanagan says. "We need to preserve that link. We've got to have these around for our children. That's what really matters."

A variety of other cloned species are already on the market. The Michigan-based Champion Tree Project sells cuttings from the nation's largest trees as trademarked "ChampTrees." With the permission of federal officials, the group recently tried to clone 4,700-year-old *Methuselah*, a bristlecone pine growing in California's White Mountains, but the grafted buds didn't take.

American Forests, publisher of the national champion tree registry, operates a nursery that sells dozens of different historic tree clones. There's a "Lewis and Clark Cottonwood" tree that harkens from a cottonwood parent at a purported Lewis and Clark campsite near Cutbank, Montana. Genetic copies of the "Harriet Beecher Stowe White Ash" from Ohio and the "Harry S. Truman Silver Maple" from Missouri are also for sale.

Despite the popularity of this trees-as-living-history strategy, not everyone is

TREE-MENDOUS: Helen Smith, a USFS fire ecologist who maintains Montana's champion tree registry, is dwarfed by the state's record ponderosa pine. The tree stands 194 feet tall and has a trunk circumference of 241 inches.

LOTS OF SHADE: Montana's 56-foot-tall champion box elder (right) grows in a front yard south of Corvallis.

BOTANY LESSON: Teacher Steve Lewis and his third-graders (far right) line up in front of the state's largest American elm, in Stevensville.

sold on the idea of champion trees begetting champion saplings. Or even that it can work.

"Certainly, there is a genetic component, but I believe that most of it has to do with the environment," says Smith, the keeper of Montana's champion tree registry.

Smith also says that a cloned tree taken out of its unique environment could be susceptible to disease in its new location.

"Through time, trees evolved with insects and diseases," she says. "Trees are hit hardest by diseases they didn't evolve with, like how whitebark pine is now being decimated by the introduced disease blister rust."

Cloning, the ecologist continues, cancels out the benefits of evolution by essentially freezing a tree's genetic structure in time. If the process of natural selection holds true, each new generation of trees should be slightly better adapted to its specific surroundings than the previous generation. A clone, then, has "learned" nothing from its parent tree, because it *is* its parent tree.

Besides, an aspen that grew fat and tall in cool, rainy northwestern Montana might wither and die in the hot, windy environment of the Pryor Mountains. Champion trees are arguably the benefactors of good luck, Smith says. They sprouted in rich soil, had access to consistent moisture, and haven't been felled by fire, lightning, axe, or disease.

There might be rational reasons for recording and preserving the kings of each tree species. But in Smith's view, the big idea behind the champion tree registry is that trees are part of what she calls the "therapeutic value of wilderness." People want to know that the same trees that provided shade and inspiration to people hundreds or even thousands of years ago are still alive today.

According to Smith, people in some parts of the country actually do spend their vacations tracking down and then viewing champion trees. This can be a relatively easy task back East, where the biggest trees usually live in protected, urban settings. There, the record-book specimens often receive tender care and plenty of food and water to keep them thriving.

Here in the West, on the other hand, champion trees are often miles from the nearest road or path. Finding them can take days. And, unlike many of their coddled urban relatives, most of Montana's big trees survived nature's worst to become champions. Many bear the scars of lightning, beetle infestation, and even ice jams. Pretty they are not. Montana's champion western red cedar, for example, sports a 6-foot fire scar on its trunk and is afflicted with patches of rot.

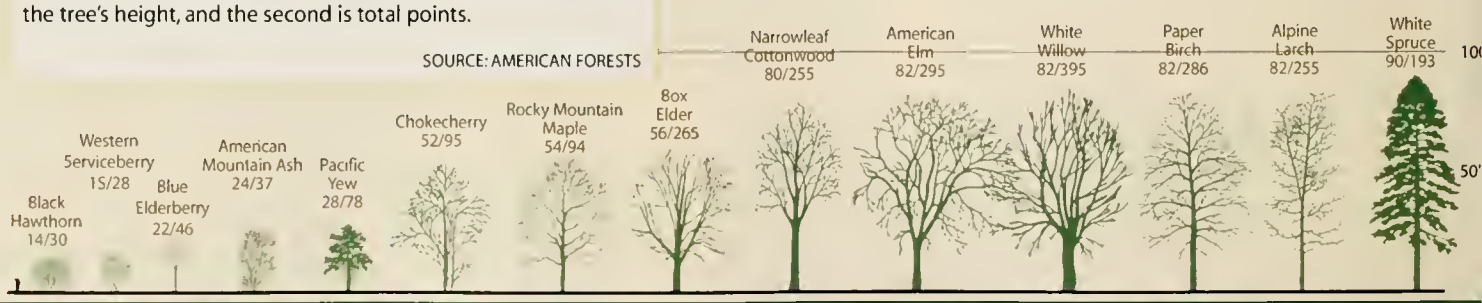
Champion trees can also be the targets of vandalism. A few years ago someone took a chainsaw to a 1,000-year-old redwood in northern California, and in 1989 the famous 150-year-old Treaty Oak in Austin, Texas, was poisoned.

Smith does not advertise the location of Montana's champion trees, for the same reason the federal Bureau of Land

MONTANA'S ROYAL COURT

Shown here are representations of 25 Montana tree champions, and the nation's tallest tree for comparison. The first number is the tree's height, and the second is total points.

SOURCE: AMERICAN FORESTS



Management doesn't reveal the locations of archaeological sites. "To protect against vandals and looting," she says.

Most of Montana's champions are found in national forests. A few, though, are on private land. According to Mark Lewing, a retired forester for the Montana Department of Natural Resources and Conservation, landowners who learn they have a champion on their property usually take pains to protect it.

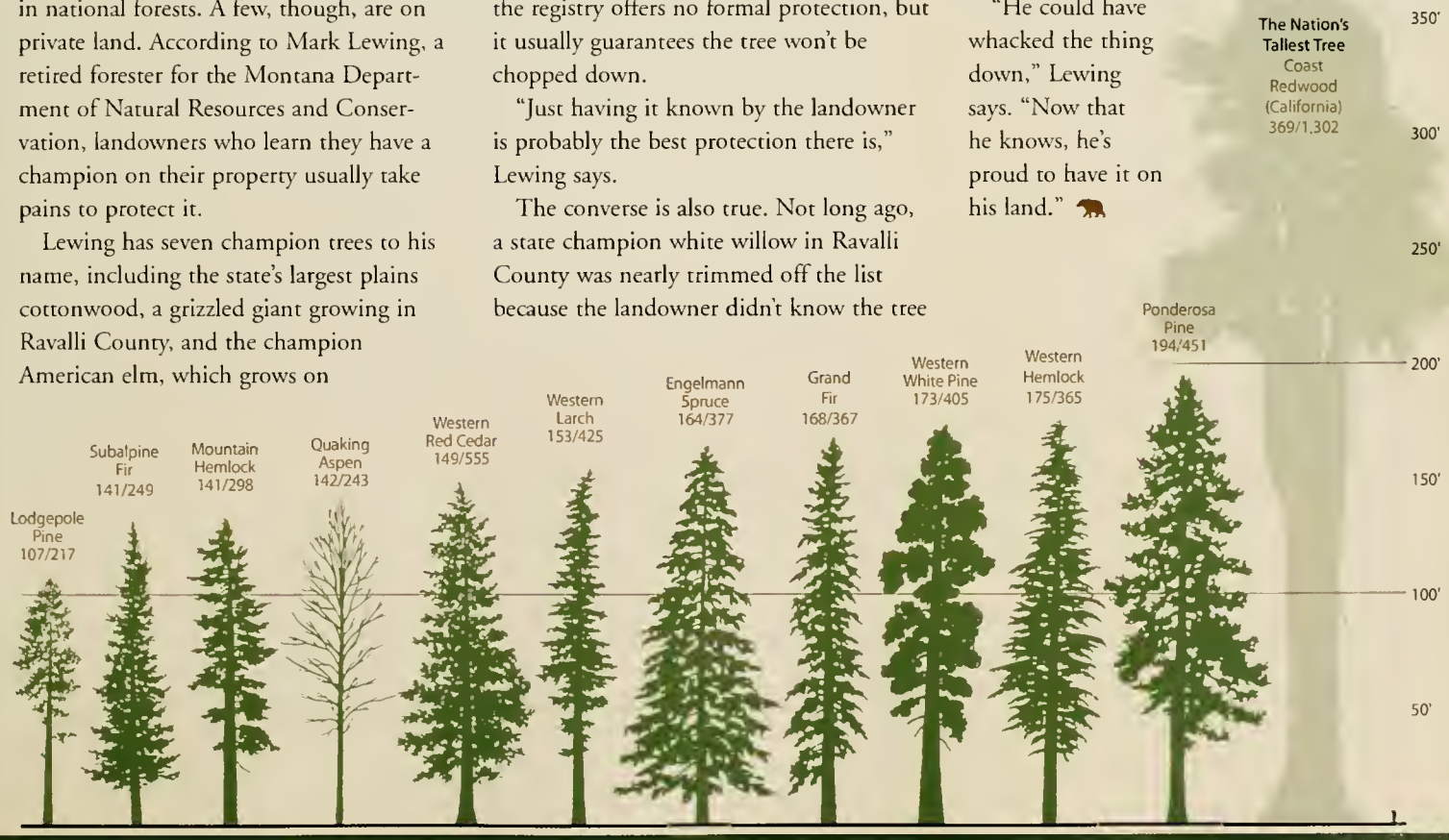
Lewing has seven champion trees to his name, including the state's largest plains cottonwood, a grizzled giant growing in Ravalli County, and the champion American elm, which grows on public school property in Stevensville.

Like other record tree owners, Stevensville school officials are proud of their 82-foot-tall champion, Lewing says. A place in the registry offers no formal protection, but it usually guarantees the tree won't be chopped down.

"Just having it known by the landowner is probably the best protection there is," Lewing says.

The converse is also true. Not long ago, a state champion white willow in Ravalli County was nearly trimmed off the list because the landowner didn't know the tree was a champion and decided to do some pruning. Luckily, not enough vegetation was removed to drop the 82-footer from the list.

"He could have whacked the thing down," Lewing says. "Now that he knows, he's proud to have it on his land."



Dry

Much of Montana is now green and lush, but the lingering drought continues to plague many fish and wildlife populations

BY ANDREW MCKEAN

Boat docks at Canyon Ferry Reservoir are floating for the first time in years, ducks are dabbling in full ponds across the state's prairie pothole region, and spring rains have made much of southeastern Montana look like Ireland.

Looks like the state's drought is finally over, right?

Not so fast.

Though it may be green and lush where you live, much of Montana is still parched from a long-term drought. The Beaverhead River is still chronically low, biologists blame drought for a recent plummet in the brown trout population on the Bighorn River, and ground moisture in the Billings area remains at Dust Bowl–era levels. Even in areas of Montana where the rivers run high and pastures are knee-deep in grass, drought continues below the surface.

"Many parts of Montana have had four or more years of drought, sometimes severe drought, so even if we return to normal or above-normal precipitation, it will still take several years to restore aquifers, reservoirs, and subsoil," says Rick Bondy, an engineer for the Water Resources Division of the state Department of Natural Resources and Conservation.

Montana FWP officials say that even though near-normal snowpacks and rains have returned to some areas, the long-term effects of this latest drought cycle will harm many fish and wildlife populations and their habitats for years to come.

Low water on some streams has hampered trout reproduction, meaning that entire year classes, or generations, of fish have been lost. Elk and deer stressed by drought may not have died outright, but many may be weaker and more susceptible to stress and disease than if grasses had been greener and more nutritious.

How bad has Montana's drought been in some areas? So bad that instead of boats floating down some

NOT SO FAST: Recent rains have made some parts of Montana look greener than they have in years. But biologists and climatologists warn that the precipitation hasn't erased the long-term effects of the most recent drought on soil, rivers, and the state's fish and wildlife.

PHIL STONE

beneath the surface

rivers, pickups have been driving upstream.

That was the case just two years ago on the Smith River, where the summer-long recreational floating season was cut to just one month due to low flows. The central Montana river actually disappeared in certain reaches during late summer.

"In 2000, and again in 2001, the lower Smith dried up completely at Eden Bridge," says Joe O'Neill, FWP manager of the Smith River recreation corridor. "We had a number of people illegally driving up the riverbed in ATVs and four-wheel-drive pickups."

Though the Montana Drought Advisory Committee has reduced its drought declaration for some soggy counties, dry soil and low water tables still plague many parts of the state. As of June, the areas of greatest concern were the Beaverhead system, the Musselshell and Tongue basins, the Yellowstone River downstream of Bighorn, the Kalispell area, and the Sun and Upper Marias basins in the north-central region.

Dry rivers, parched prairies, burning forests. While drought is still the talk of many coffee shops and sale barns across the state, it's difficult to quantify the depth of the damage. Ranchers still fret about thirsty pastures, and irrigators worry about paltry snowpack. Suburbanites grumble about water restrictions, and boaters keep their eyes peeled for prop-eating rocks that jut unexpectedly from the water.

Assistance programs can help people weather the worst weather. But it's a different story for many fish and wildlife species that must survive drought on their own. For example, dry years force elk to move constantly in search of green grasses and forbs.

"Drought causes an energy drain on elk throughout the year," says Gary Hammond, FWP wildlife biologist at Dillon, "but the problem is particularly bad during the spring calving season, when cows have high energy demands from their pregnancy and lactating."

Hammond says stress on cow elk reduces calf weight and survival. In his area, the number of elk calves born in recent years has been 30 to 50 percent of what he would expect it to be.

Drought hits fish even harder. Species that require specific water levels or flows to reproduce, such as arctic grayling and cutthroat trout, are declining in number due to low water.

"Fish species need more than just a trickle to survive," says Kathleen Williams, manager of the FWP Fisheries Division's Water Resources Program. "Take paddlefish. They need a big surge of water to trigger their spawning. Without that, we just don't see much in the way of reproduction."

The effects to fish are most acute on Montana's smaller rivers. FWP fisheries biologist Joel Tohtz has been watching with

concern as the trout and minnow populations in the Shields River have continued to shrink. The stream's feeble flow, used for irrigation, was further restricted by years of subnormal snowpack in the Crazy Mountains. In some reaches last summer, the south-central Montana river stopped flowing entirely, says Tohtz. Instead of a stream, it existed as isolated pools of warm water between expanses of sun-baked river rock.

"The Shields is a stream that's chronically dewatered," says Tohtz, who works in Livingston.

Tohrz says the river's habitat has been damaged due to channelization, deposition, riprap, and blown-out banks. Despite the habitat degradation, the fishery can sustain itself if the Shields has adequate water flow.

"But when the flows are reduced past a certain point," he says, "then the fishery just collapses."

In central Montana, the Musselshell River disappeared in several reaches during the past three years, temporarily dooming its popular brown trout and smallmouth bass fisheries.

Fisheries in reservoirs aren't immune from the effects of drought, either. Mike Ruggles, the FWP biologist who manages Fort Peck Reservoir, says he is concerned that the declining water level will expose shoreline spawning habitat used by spottail and emerald shiners. Without this important forage fish, the reservoir's popular walleyes will prey on each other and eventually starve to death.

Ruggles also points out that continued low water makes it difficult for FWP to collect enough eggs from wild walleyes to rear at the Miles City warmwater hatchery and then stock back into the reservoir.

Drought has also hammered the state's coldwater hatchery program. Gary Bertellotti, FWP hatchery supervisor, says a lack of rain and snow has meant reduced groundwater supply, fewer eggs, and fewer brood stock fish. Added to that is increased demand by biologists statewide to stock pond and reservoir fisheries suffering fish kills from the drought.

GARY LEPPART

BROWN RIBBON FISHERY: Though it is flowing today, the Musselshell River has been without water in many stretches during the past few years. The return of water doesn't necessarily mean the return of fish, however. Many bass or trout either moved far downstream or died.

"The hatcheries are really struggling now to stock more and larger fish to recover fisheries that have either been reduced or totally wiped out by drought," he says.

Bertellotti adds that drought was probably responsible for bacterial kidney disease detected this spring at the Big Springs hatchery in Lewistown, which forced FWP to destroy roughly 100,000 rainbow trout and arctic grayling. The disease likely broke out in the wild brood stock because they were stressed from low water and high temperatures, he says.

DROUGHT DEFINED

Much of Montana is suffering from its fourth or fifth consecutive year of drought. Despite scattered rains in some places this spring, most of the state was classified by federal climatologists *at best* as "abnormally dry" in June, and much of the state's central and southern region remained classified as "severe drought."

The intensity of the drought varies by location, says Gina Loss, a hydrologist with the National Weather Service in Great Falls.

"It's misleading to say that the whole state of Montana is in drought," says Loss. "There's a band of what is defined as severe drought from the east slope of the Rockies southeastward to Carter County and also in the southwest. But you have other areas of the state that are in good shape. Much of northeastern Montana is doing okay."

If it's difficult to characterize the state as a whole, it's also hard to pinpoint consistent definitions of drought. It's not simply a shortage of precipitation, says Loss. For example, one county may be in drought in terms of groundwater supplies or river flows, but not in terms of effects on agricultural crops.

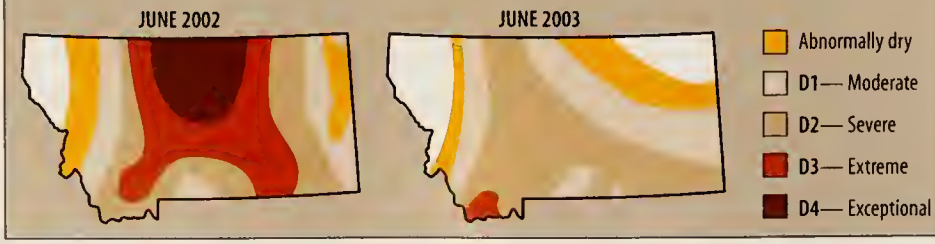
No matter how you define drought, it obviously affects fish when a river section dries up. But it also can cause delayed reactions, which can create a management dilemma on certain popular sport fisheries. Tohtz says a trout that goes into the winter in poor shape from the summer's high water temperatures and low flows may have trouble surviving until spring. Add to that the effects of being caught by anglers, and the stress can be enough to kill the weakened fish.

"Anglers on the Yellowstone River are good about restricting fishing when the temps are high and flows are low in the summer," Tohtz says, "but as soon as the river cools, the crowd is back and everybody thinks things are okay." Efforts to curtail fishing when water conditions appear fine are met with less enthusiasm than

Andrew McKean is an FWP information officer at Glasgow.

Not as dry as 2002, but not exactly wet, either

These maps, based on federal data, show that Montana's drought has improved substantially since last year. But drought (D) still affected much of the state as of June.



MONTANA OUTDOORS

when water is low, he says.

Why doesn't FWP just stock trout to replace those killed by drought? According to Williams, research in the early 1970s showed that stocking can actually harm existing wild trout populations.

"After a drought cycles through a stream system, it takes several years of favorable flow conditions before the naturally reproducing populations can repopulate," she says. "We can't speed that up by stocking hatchery fish."

LONG-TERM DAMAGE

Like trout, mule deer and antelope can also exhibit a delayed reaction to drought.

"Big-game animals that depend solely on native forage are certainly affected by drought, but sometimes it's not immediately noticeable," says Pat Gunderson, FWP wildlife biologist at Glasgow. "Poor forage can cause long-term deterioration of their physical condition, which usually isn't immediately fatal but can affect wildlife populations once we get a harsh winter."

He says drought reduces the availability of late-summer forbs needed by grazing wildlife to prepare for the colder months ahead. The effects can be especially hard on antelope and deer fawns.

"If quality forage dries up before the lactation period is over, the fawns will be in poor condition entering the winter," he says. "And if it's a tough winter, many of them won't make it."

So far, Montana's deer and antelope numbers have remained stable statewide despite the lack of water. But FWP is keeping an eye on the populations and will adjust hunting regulations if numbers drop due to delayed effects of dry weather.

Though they can't make rain, FWP biologists have taken steps to reduce the state's vulnerability to drought.

"What we're doing is recognizing the fact that these dry cycles are inevitable and trying to offset the effects of drought whenever possible," says Williams. Among the agency's drought-related efforts:

- Promoting water conservation.
- Restricting angling and other uses on some rivers when flows drop or temperatures rise to certain thresholds.
- Working with reservoir operators on releasing water at levels that benefit downstream fish populations.
- Working with irrigators to line ditches, convert to more efficient watering systems, switch to wells for livestock watering, and lease available water rights to FWP to retain in streams. "Many irrigators have tried hard to keep streams flowing, despite the hardship it brings," says Williams. "That doesn't get recognized a lot."

Another point biologists make about drought is that some species, especially prolific upland birds, are able to bounce back quickly. That appears to be the conclusion of a study of radio-tagged sage grouse in north-central Montana, where nesting success and chick survival spiked shortly after timely rains in 2002.

"Sage grouse and sharptails have evolved in this arid climate," says Gunderson. "Even during these most recent drought conditions, they seem to be able to handle it."

That's not to say upland birds can't perish during extremely dry or hot weather.

"During one especially hot summer, we saw sharptail chicks baked in their eggs before they could hatch," Gunderson says.

Because sharptails reproduce in high numbers, even hard-hit populations can rebound once temperatures cool and rains return.

BOUNCING BACK: Recent rains and normal snowpack spell relief for fish and wildlife in many counties. Species such as mule deer that have evolved on the prairie will quickly recover from this drought—and the inevitable next one.

DENVERBRYAN.COM

That's even more true for waterfowl. During the past several years, many prairie potholes in northeastern Montana disappeared. As the wetlands shrank in size and number, duck production plunged. The U.S. Fish and Wildlife Service last year blamed the persistent drought in the Great Plains of the United States and Canada for the worst ever fall flight of pintails.

Gunderson says spring rains have since filled many northeastern Montana potholes, most noticeably in southern Phillips County, a key area for waterfowl production. Resident duck numbers this fall should increase accordingly.

If even rainless clouds have silver linings, the one good thing about this drought—lingering in many areas, dissipating in others—is that it's a reminder that dry skies are normal for this region. Native prairie species—including native eastern Montanans—have evolved with regular, periodic drought, and a lack of water accounts in large part for their ruggedness and resiliency. In much of the Great Plains, drought is simply the natural order of things.

"Most of the state east of the Continental Divide is semiarid," says Williams. "A drought is really just one small step beyond that. It's not an unforeseen disaster. We know drought will return, and probably sooner than later. That means we can now take steps, such as reducing water use, to lessen our vulnerability to the next drought."

Assay Office (left) and Meade Hotel by Jim Blakesley

Montana Outdoors

THE SPIRIT OF THE WEST

The state's premier ghost town, Bannack State Park gives visitors a glimpse of Montana's colorful frontier past

By John Barrows

Clappa, clappa, clap.

The old gray courthouse door, weathered beyond its 128 years, bangs slowly in the wind. If there aren't ghosts out prowling tonight in this abandoned gold rush town, there sure ought to be.

For Bannack, now a Montana state park, is a town of memories and lost hopes. Once the queen of Montana gold rush towns, and for a brief flash in history the fledgling territory's first capital, Bannack offers a glimpse into a lively era of boom and bust, brass and bluster. Thanks to the efforts of a few history-minded folks a half-century ago, the gunslingers, saloonkeepers, miners, dancing girls, and other ghosts of Bannack are still very much alive and waiting to be discovered.

A trip to Bannack, named for a tribe of American Indians who once camped nearby, is a trip back to the dusty days of early Montana. There is no glitz or glitter at this national historic landmark. You'll find no souvenir shops, no concessions, no motel rooms with cable. What you will find, however, is one of the best-preserved ghost towns in the West. An afternoon spent poking in

and out of abandoned buildings and looking at the hangman's gallows gives visitors a chilling and very real sense of those early days.

Bannack State Park sits in a canyon along meandering Grasshopper Creek, named for the swarms of leaping insects encountered by Jack White and John McGavin, who first found gold there in the summer of 1862. News of their discovery spread quickly, and practically overnight there was established a camp alive with speculators, miners, and other characters, often unsavory, attracted to the gold. This was truly the American West at its wildest, where work was dirty, liquor flowed freely, and laws were enforced from the barrel of a gun. In *Roadside History of Montana*, author and historian Don Spritzer offers this glimpse into Bannack's earliest days from Emily Meredith, one of the camp's few women, who wrote in 1863:

> I don't know how many deaths have occurred this winter but that there have not been twice as many is entirely owing to the fact that drunken men do not shoot well... bullets whiz around so, and no one thinks of punishing a man for shooting another.

That same year began one of the most famous legends of Montana history, the story of the Vigilantes. This group of citizens, the story goes, banded together to rid Bannack, Virginia City, and other mining towns of murderous highwaymen known as the Innocents, headed by Bannack sheriff Henry Plummer. Though most Montanans still maintain that the Vigilantes were essential to territorial peace, the picture today is not as clear-cut as it once was.

Based on original accounts, many of them from participants or proponents of the Vigilantes, Plummer and 150 other cutthroats terrorized the region, robbing stagecoaches and killing dozens of men during their reign of terror.

In December 1863, citizens of Bannack and Virginia City organized a vigilance committee to combat the crime. On a cold January day in 1864, committee members captured Plummer along with his two deputies, Ned Ray and Buck Stinson. The trio was herded at gunpoint up what became known as Hangman's Gulch, on the outskirts of Bannack. In sub-zero weather, each man was lifted up and dropped from the end of a hangman's rope on a gallows built earlier by Plummer himself. The three paid with their lives for the robbery and murder they were accused of committing. Over the next two weeks, under the authority of the committee, as many as 18 others were apprehended and hanged.

GOLD NUGGETS BY NEIL & MJ MISHLER

MONTANA HISTORICAL SOCIETY

AL TROTH

GOLDEN AGE: In 1862, two prospectors found gold nuggets in Grasshopper Creek, and soon rails were laid and cars were hauling the precious metal from placer mines. By 1895, when the photo at top was taken, Bannack had lost much of its precious metal—and most of its residents. Today the town is populated mainly by tourists, ghosts, and the occasional mule deer or mountain bluebird.

ALAN G. NELSON

In recent years, some have questioned the motives of the Vigilantes, as committee members called themselves. In several books published over the past few decades, historians have maintained that members of the vigilance committee may have been motivated more by politics and opportunism than by justice. Some recent accounts say that the Vigilantes were organized by Chief Justice Sidney Edgerton and his nephew, Wilbur F. Sanders, and that the two considered Plummer a political rival. Other accounts say jealousy, the Civil War, and the fraternal group the Masons may have played a hand in the Vigilante affair.

What is known for sure is that Sheriff Plummer was not implicated through traditional legal procedures but rather by testimony of a suspected criminal the Vigilantes had captured and interrogated.

"I think it's a pretty safe bet that some people were strung up by the vigilance committee who probably shouldn't have been," says Clark Whitehorn, editor of *Montana The Magazine of Western History.*

Today, there is still plenty of controversy over the guilt and innocence of both the Innocents and their executors. Passing by the replica of the gallows standing where the hangings took place, a visitor is reminded that ongoing debates over whether or not the executions were justified are a grave matter indeed.

There's no disagreement, however, that Bannack is a place worth saving, or that the state of Montana and its visitors owe a debt of gratitude to Alfreda Woodside and C. W. Stallings. In 1954 the newly formed Beaverhead County Museum and its indomitable matron

John Barrows is editor of the Dillon Gazette.

learned that much of old Bannack, even then essentially a ghost town, was up for sale. Woodside raised money for the purchase, but it was not enough. So Stallings, a wealthy businessman and longtime Bannack resident, bought the site at a tax sale. He then sold the town site and roughly 20 old buildings to the museum, which in turn gave the holdings to the state of Montana. Stallings later donated to the state several additional lots and buildings.

Eventually, Montana deeded the ghost town over to the Department of Fish, Wildlife & Parks, which began a long process of preservation and additional acquisitions until the town site of Bannack, with over 60 buildings—including miners' log cabins, saloons, stores, and the Methodist Church—became a state park, securing an important part of Montana's heritage.

For Bannack was more to Montana than just a classic western boomtown. Within a year after gold was discovered, the town had attracted several thousand residents, a growing number of whom were eager to civilize the rough-edged community. In 1864, after Congress proclaimed Montana a territory, territorial governor Sidney Edgerton named Bannack as his capital and, that same year, convened the first territorial legislature there in a dirt-roofed cabin.

The boom ended nearly as quickly as it began. Gold found near Virginia City and other distant sites lured miners away from the fledgling capital. By 1880, fewer than 250 citizens remained, and by then the territorial capital had been moved to Virginia City. Still, Bannack was able to hang on for nearly 80 more years, as various methods of mining scraped up enough gold to keep the town from dying out completely.

Angela Hurley, Bannack State Park manager, is the keeper of the keys for Montana's first territorial capital. She relishes her job, as much for its variety and sense of responsibility as for the chance to meet and help thousands of visitors each year explore the historic site. Hurley, who stays at the old town as one of the park's permanent employees, has an endless supply of stories. And yes, some of them have to do with spirit visitors in the night.

Isolated and alone, Bannack certainly gives the appearance of being a ghostly haven, and the stories about its otherworldly residents abound. Many of them center on the old Meade Hotel, once the courthouse, and its most famous guest, little Dorothy Dunn. Hurley says many visitors "feel" the presence of what some have identified as the spirit of the young girl, who drowned in a pond at the edge of town decades ago. Clad in a blue dress, Dorothy still walks the upper halls of the old brick building—or so they say.

And hardly a month goes by in the summer, says Hurley, when a visitor doesn't mention having heard the faint sound of babies crying. It's probably the wind—though Hurley does note that, years ago, the Amede Bessett house was used to quarantine sick and dying children. Other stories abound, Hurley says, and true or not, they lend a spectral note to a Bannack visit.

Ghosts aren't the only attractions that lure people to the old gold camp. Bannack is like a window into history, Hurley notes, with its deserted buildings providing a peek into not just the earliest gold rush days but also the later years as the town continued its slow decline before being deserted.

A big part of her job is to make sure it all stays that way. That's why Hurley, along with a small staff of park employees and dozens of volunteers, works to ensure that visitors get a true look not only at Bannack the queen of the gold camps of the 1860s, but also Bannack the county seat of the 1870s and Bannack the old mining camp from the turn of the century.

And the Bannack of today. For even now, the town can ring with the very real sound of laughter, lectures, poetry, and music.

Rather than restore Bannack to its earliest days, Hurley says, park supporters decided instead to stabilize the town and preserve what was left of it when the state acquired the site in the mid-1950s. Unlike its sister gold camp, Virginia City—which has been partially restored, has become a major tourist draw, and is still a living

IF TAVERNS COULD TALK: An elegant antique bar in Skinner's Saloon invites visitors to imagine those who long ago bellied up for a whiskey or beer. Background image (also on page 24): Residents of Bannack stand before the Goodrich Hotel sometime in the 1890s.

JILL GRIFFEN

MONTANA HISTORICAL SOCIETY

TIM EGAN

AMAZING GRACE: The elegant window frames in the Methodist Church, built in 1877, contrast against the straight, rough timbers that frame the building. Such contrasts exemplify life in frontier towns such as Bannack, where social grace struggled to find a place amid violence, lawlessness, and physical hardship.

MONTANA HISTORICAL SOCIETY

town—Bannack has retained its abandoned, ghost town visage.

That does not mean the town has been neglected. Over the years, Hurley notes, substantial improvements have been made to the site, many of them not apparent to visitors. If you know where to look in the boardwalk that threads through town, you'll find sections that lift up, revealing water mains and fire hoses. Smoke and heat detectors are hidden away in almost every building. Many of the buildings have undergone substantial work, such as new foundations (hidden from view) built beneath buildings, old ripple glass added to windows, and new sill logs and ridge poles installed to prevent further decay. The idea, says Hurley, is to keep the town looking the way it did at the end of its useful life in the mid–20th century, preserving the many different eras of Bannack's short but vibrant life.

That can be expensive, exacting work. Preserving even a small building can cost tens of thousands of dollars, and a big job, like preserving the hotel, can run substantially more. But it's a need that can't be overlooked, Hurley notes, if Bannack is to survive the ravages of weather and the footsteps and curious hands of so many visitors.

Though many of its principal buildings have already received substantial preservation, many more need repair. A major project now underway is a fund-raising effort called Raise the Roof, aimed at putting a new roof on the Meade Hotel and preserving the building's interior.

The Meade Hotel is a Bannack landmark and one of the town's most widely recognized buildings. Built in 1875 as the Beaverhead County Courthouse, it was an example of immense civic pride. Little expense was spared, and over the years much of its splendor—like the winding staircase, stately courtroom, and several big iron safes—has survived. Just a few years after the courthouse was built, however, the county seat was moved to Dillon, and the building was converted into a hotel.

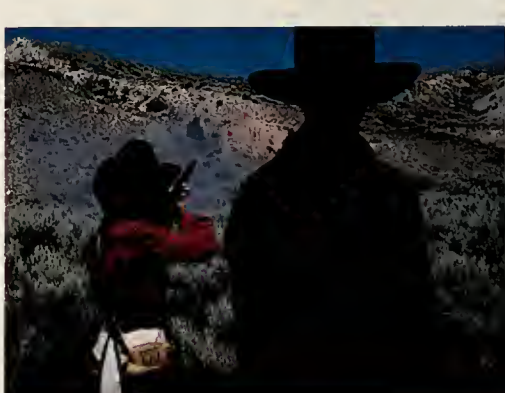
Though no longer lodging guests, the hotel still attracts thousands of visitors each year. During special events, its old dining room rings to laughter and the clink of dishes as volunteers heap breakfast plates with biscuits, eggs, and ham.

Bannack sees visitors during every season of the year. In winter, the old dredge pond resounds with the chatter of skaters, warming themselves by an outdoor bonfire or sipping cocoa in the warming house. Visitors don't even have to bring their own skates; the park provides them free of charge.

In spring the streets bustle with schoolchildren from across Montana making their annual pilgrimage to one of the state's most storied historical sites. It's a Montana rite of passage, like visiting the state capitol building, riding a horse, or catching a cutthroat trout. From Memorial Day through Labor Day, the visitor center is open, and guided tours are held daily. A series of Saturday programs known as Let's Raise the Roof, a nod to the fund-raising campaign, includes music and lectures on various aspects of Montana history and life. Like almost all park events, program fees are included in the regular park admission fee.

In June each year the park celebrates Dale Tash Montana History Day. Tash, a former park manager and noted Montana historian, did much to establish Bannack's place as one of the premier parks in the state, and his memory is honored with the annual event.

On October 24 and 25, the spirits of Bannack return for a Halloween bash during the annual Ghost Walk, when ghostly and ghastly tales of life in the gold camp



PHIL FARNES

BERT GILDART

VIGILANTE CAIRN, MONTANA HISTORICAL SOCIETY

The mystery of the so-called "vigilante code"

For years, the mysterious numbers 3-7-77 were posted on doors as a threat of banishment in Montana. Popular belief was that they had been used by the Vigilantes who hanged Bannack's Sheriff Henry Plummer in 1874. But according to an extensive article in the Spring 2001 issue of *Montana The Magazine of Western History*, the numbers were first used in 1879 to scare "undesirables" out of Helena. In the 1920s, they were pinned to the back of several men lynched by vigilante mobs. (Interestingly, the Montana Highway Patrol added the numbers to their shoulder patch and car door insignia in 1956 as a tribute to law and order.) The numbers have been thought to be a Masonic code, the dimensions of a grave, or the exact time—in hours, minutes, and seconds—vigilantes gave their targets to leave town. However, no records exist to prove any of these or other theories. The numbers' origins, writes the article's author, Frederick Allen, still remain "a complete and utter mystery."

are told in the dark and spooky setting. And in January, local volunteers reenact the hanging of Plummer and his deputies.

The park's centerpiece event is Bannack Days. It all began 27 years ago, during the nation's bicentennial celebration, to bring a bit of Bannack's history back to life. Since then, the third weekend in July has become a time to experience "the way it was," as several thousand people attend the two-day event to eat pioneer foods, clap their hands to old-time music, and boo or cheer during the annual Women's Suffrage Debate held on the steps of the Meade Hotel. Gunfighters and wool spinners, black-powder enthusiasts and candle makers, fiddlers and hide tanners all show off the old crafts and lifestyles to three generations of visitors. Stagecoaches and horse-drawn buggies clatter down streets packed on either side with revelers, giving a sense of the town's energy and activity more than a century ago.

JOHN BARROWS

YEAR-ROUND ACTION: Though still a ghost town, Bannack today can buzz with activity. The big bash is in late July during Bannack Days, which attracts up to 10,000 visitors. Activities include singalongs, black-powder rifle shooting, gunfights, and stagecoach rides. But even in winter Bannack is lively, as skaters glide across the frozen town pond between sips of cocoa.

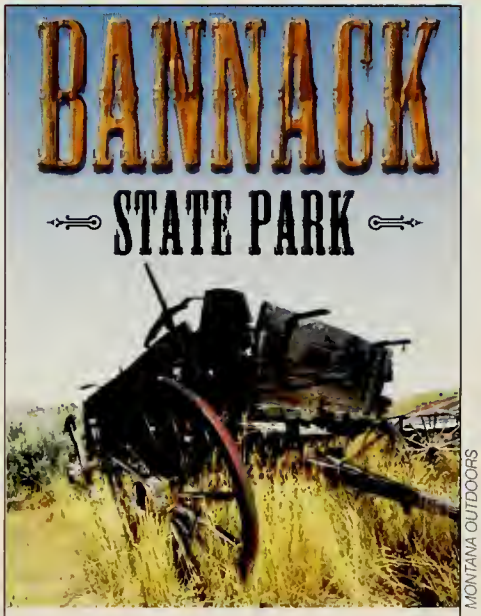
Hurley says Bannack Days and much of the park's vitality and preservation wouldn't exist without the help of volunteers. People from throughout the country come to Bannack each year to help out, often staying at the park campground.

Volunteers park cars, serve food, clean and restore buildings, and demonstrate old-fashioned skills such as blacksmithing. Several would-be gunslingers even "die" in the streets during Bannack Days shootouts.

"Volunteers help with tasks that there just isn't time or money for our limited staff to accomplish," says Hurley.

Many are members of the Bannack Association, a support group of some 200 members who donate time and money for special park projects. Begun in 1991, the association publishes a newsletter and helps with historical research and other activities. According to Stan Smith of Dillon, a past president, the group provides a way for individuals to help out the park while gaining a personal stake in the area's rich history. But most of all, being a member of the association is "just plain fun," Smith says. And he should know, having helped fill the air with smoke as a gunfighter since the very first Bannack Days celebration in 1976.

Historical reenactments, myths, ghosts, legends, and more, Bannack State Park offers visitors a tangible link to the state's rich heritage and a chance to ponder one town's rich and sometimes-tragic past. On a recent evening stroll down Bannack's empty main street, a lone visitor hears a tapping sound in the distance. Maybe it's a sheriff shuffling slowly to the gallows. Or the footsteps of a barefoot little girl, her hair dripping water, trying to get home. Or maybe it's simply a weathered old shutter, softly knocking in the wind, asking if Bannack's colorful past might be allowed to enter a passerby's imagination.



MONTANA OUTDOORS

IF YOU GO

Open: Every day except December 24 and 25.

Hours: 8 a.m. to 5 p.m. October through April, and 8 a.m. to 9 a.m. May through September.

Visitor center: Open Memorial Day through Labor Day.

Location: 3 miles south of Dillon on I-15, then 20 miles west on Montana Highway 278, then 4 miles south on a county road.

Activities: Picnicking, camping (24 sites and a rental tepee), birding, fishing, and hiking.

Park information: (406) 834-3413, or on the Internet at fwp.state.mt.us/parks.

Bannack Association: To learn more about this group, call the park office.

PHOTO ILLUSTRATION BY MONTANA OUTDOORS

MAYBE IT SEEMED LIKE A GOOD IDEA at the time. After all, lake trout are a big, tasty sport fish. But the ones somebody illegally stocked in Yellowstone Lake ended up eating more than just anglers' lures. The voracious predators, close cousins to bull trout, now threaten to "bring the lake's pure-strain Yellowstone cutthroat trout to its knees," says Todd Koel.

Supervisory fisheries biologist for Yellowstone National Park, Koel says recent survey nets show the lowest level of cutthroat trout since surveys began in 1969. And the problem isn't just one for cutthroat anglers. Bald eagles and grizzly bears are among dozens of species that rely on spawning cutthroats as a vital spring food source. Lake trout, on the other hand, spawn in the fall, in deep water.

"Park studies have shown that 42 terrestrial and avian species use cutthroats," says Koel. "[Lake trout] are definitely disrupting the ecology of the lake."

Illegal introductions are toppling fisheries and damaging ecosystems throughout the United States. And Montana is no exception. FWP has documented more than 400 illegal introductions in state waters. Northern pike are the most prevalent sport fish illegally stocked in Montana's lakes, rivers, and streams. But yellow perch are a close second. Biologists know of 60 waters in the northwest region where the panfish species has been dumped into lakes by what fisheries professionals call "bucket biologists."

The unauthorized plantings are carried out by anglers who want new fish in local waters. For years, coldwater species have ruled Montana's fishing world, but recently many anglers have been coveting Midwestern fish, warmwater species such as the walleye, northern pike, and yellow perch. Not only are these considered among the tastiest of fish, but warmwater species are often readily available to ice anglers, who are reeling in the illegal transplants in record numbers.

The new action comes with a hefty price, however. Often with each new introduction of pike, perch, and their bucket-born cousins comes a crash in the existing trout or salmon population. What's more, illegal introductions can ruin entire ecosystems and end up costing FWP—or, more precisely, Montana anglers—mas-

OUTLAW INTRODUCTIONS

WHEN ANGLERS ILLEGALLY TAKE FISH MANAGEMENT INTO THEIR OWN HANDS, THE RESULTS CAN BE DISASTROUS

BY DAVID MADISON

sive sums that could otherwise be spent to improve fishing in other waters.

One of the most notorious mistakes made by a bucket biologist happened at Lake Mary Ronan. This once-exquisite kokanee salmon fishery near Proctor was the scene of an illegal yellow perch stocking in the spring of 1992. Two boys fishing nearby watched as a man drove out onto a dike by the lake's outlet, emptied two buckets into the water, and drove away.

The boys rushed to the site and saw yellow perch swimming near the surface. They reported the incident to FWP, which netted 33 perch and later caught the man responsible for the illegal activity.

Over the next few years, the perch population exploded before stunting out into a giant school of mainly 4- to 6-inch-long fish with an occasional "lunker" of 10 inches or more. In the meantime, the nationally renowned kokanee population has plummeted, dropping 70 percent from before the perch showed up.

The repercussions of one illegal introduction can extend statewide. FWP depends on Lake Mary Ronan to supply many of the salmon eggs it needs for raising fry and restocking fisheries around Montana. In a good year, FWP expects to collect 2.6 million salmon eggs from the lake. In 2002, it gathered just 1.4 million, meaning that this year many salmon plants had to be reduced or cut.

On a cold January afternoon, the snow-dusted surface of Lake Mary Ronan is dotted by ice fishermen. Maybe 20 anglers have spread themselves out around the lake. Only half are fishing for salmon because the catch rates have dropped so much. The rest are pulling in perch at a steady pace. Many argue the perch are a welcome addition to the lake. Using a wax worm, Paul Brash of Columbia Falls is having a so-so day on the ice. The perch are biting, but not at the rapid-fire pace that has made Brash a huge fan of the species.

"We catch perch consistently," says Brash, who, like many regulars at Lake Mary Ronan, insists the panfish species were in the lake before the notorious dumping incident in 1992—a fact FWP counters with its own meticulous fish population survey records.

"The salmon are plants, and I gotta guess the rainbow are plants,"

continues Brash. "What's the problem with the perch?"

The problem, say FWP biologists, is that yellow perch are capable of becoming a virtual mono-species. They can adapt to many types of habitat, and their ability to rapidly reproduce allows them to overwhelm competing game fish. The department has recorded 60 places where perch exist in the northwest region. In some 55 of those fisheries, perch have stunted out at 6 to 8 inches—too small to be worth filleting for many anglers. And in many of the lakes, perch have caused a decline in the numbers of other sport fish. Jim Vashro, FWP northwest region fisheries supervisor, fears perch infestations more than any other illegally dumped fish species because of the way they can trash other fish populations.

"Again and again we see a net loss to the fishery," says Vashro. "The introduced perch bombs out and takes the existing species with it."

And the problem isn't limited to perch. Northern pike illegally dumped into lakes and reservoirs throughout Montana have damaged other game fish populations without producing keeper-sized pike. This past spring, FWP biologists removed nearly 500 northerns from Pishkun Reservoir near Choteau. For decades the reservoir's pike—which average just 18 inches long—have hampered attempts to create a trophy trout or salmon fishery.

ERIC ENGBRETSON

STAMP-SIZED FILLETS: Though panfish like these bluegills taste great and bite readily, they often overrun a lake and stunt out at a size too small for anglers to keep. FWP biologists only stock panfish in lakes where they are sure the species will grow well and not affect existing fisheries.

If ruining existing sport fisheries weren't enough, illegal stocking can also damage lake environments and threaten protected fish species. For example, carp introduced to shallow lakes stir up bottom sediment, blocking sunlight from reaching aquatic plants eaten by waterfowl and other wildlife. In Milltown Reservoir, near Missoula, northern pike have been devouring federally listed bull trout.

Then there's the issue of fairness. Those who intentionally dump new fish into a lake are thumbing their noses at anglers already happy with the current fishery.

"How would you like it if some night at your favorite pond or lake someone came in and put a bunch of new fish that in time would wreck your fishing?" says Vashro.

Another strike against illegal introductions is the high cost of trying to remove the unwanted newcomers from an established fishery. In its efforts to foster more stable, healthy fisheries, FWP has often been forced to remove all the fish in a lake or pond by treating the water with a fish toxicant called rotenone. As part of this "fishery rehabilitation," the agency then restocks the water with coldwater species. At places like Rogers Lake and Lion Lake—both in the northwestern region—rotenone treatments and restockings have reestablished popular coldwater fisheries. Instead of stunting out as the perch and pike do, the trout, grayling, and salmon maintain a diverse and sustainable population of keeper-sized fish.

Rehabbing can work, but it's expensive, running from $10,000 to $15,000 for smaller lakes and $50,000 or more for larger ones. Lakes like Mary Ronan are so big the agency can't afford to rehab them.

Who pays for the costly treatments? Anglers, says Chris Hunter, FWP Fisheries Division administrator. Hunter adds that the cost of rehabilitations forces FWP to postpone or cancel projects to improve other fisheries or introduce new fish legally into other waters.

"The time and money we spend trying to repair these damaged fisheries would otherwise be spent on other fish management work, such as improving habitat or stocking fish," he explains. "Every time someone dumps fish in a lake, it's everyone else who buys a license that has to pay to have those fish removed."

Ruining fisheries across the United States:

YELLOWSTONE'S LAKE TROUT

The cost to remove lake trout from Yellowstone Lake in Yellowstone National Park eventually will run into the millions of dollars.

That's according to Todd Koel, park supervisory fisheries biologist, who says the park now spends $300,000 per year for two boats with crews to drop and lift 10 miles of gill nets across the lake's bottom each day. Since the effort began in 1994, the nets have hauled in some 56,000 pounds of the illegally introduced trout.

The park also allows unlimited harvest of lake trout by anglers, though that catch is just a fraction of what the nets haul in.

Lake trout removal is necessary to prevent the species from taking over the lake, which Koel says is one of the country's last strongholds of genetically pure cutthroats.

"People need to understand the cost of an illegal act like this," says Koel. "The money we spend on netting lake trout should be going to improve the park. These are taxpayer dollars going to something that didn't need to happen."

JEFF HENRY/ROCHEJAUNE PICTURES

GILLED GLUTTONS: Voracious lake trout illegally stocked in Yellowstone Lake, have eaten so many native cutthroat trout that the native's population has dropped to record lows.

WILLIAM H. MULLINS

FROZEN FISH: Another appeal of warmwater species, such as yellow perch, is their readiness to bite in winter. Yet when illegally stocked, this walleye cousin often stunt out at just 6 inches long and ruin the existing fishery, say biologists.

Yet another problem with outlaw introductions is their damage to local economies. Perch in Lake Mary Ronan are putting at risk several million dollars that kokanee salmon anglers spend in the area each year. After rehabbing, fishing pressure at Rogers and Lion Lakes grew from near zero use to over 3,000 angler days of fishing per year. "Perch and pike threaten the more than $250,000 per lake now going to that local economy each year," Vashro says.

SOME PIKE DO FLOURISH

"It was like a freight train passing in front of your headlights," says spear fisherman Shayne Hatfield, recalling what a giant northern pike looks like through a skin-diving mask. Spear in hand, Hatfield marveled at the pike years ago while he was submerged in Hanson-Doyle Lake, a grassy pothole outside of Whitefish.

What Hatfield saw is a fact fisheries biologists concede, that some illegally stocked pike grow large, like the 36.5-pounder—almost a state record—that was pulled from a Flathead River slough in 1999.

There's also no denying that many anglers love the taste of warmwater fish. Just ask angler Burt Vasquez, whose eyes settle into a dreamy stare when he talks about having pike for dinner.

"I love to eat 'em," says Vasquez, who fishes McWennegar Slough near Kalispell.

Brash, the perch devotee, says the same thing about his favorite fish. After filleting a bucketful pulled from Lake Mary Ronan, he breads and deep-fries the succulent white meat for dinner. Then later in the evening, he'll go to the fridge and nibble on the leftover, bite-sized fillets.

"I start eating those things and I can't quit," Brash says.

Another reason bucket stocking can be a hard habit for anglers to kick is that it was once official state policy. Dumping fish here and there to improve fishing is what Montana and other states did for decades.

"The old fish management was a Johnny Appleseed approach, where you just throw fish around and see what happens," says Vashro.

In many cases, that worked fine. Many sunfish, bass, crappie, perch, and walleye fisheries throughout the state originally came from official state stockings. Same with Montana's nationally famous rainbow and brown trout fisheries. And in certain scenarios, the well-managed introduction of warmwater species to trout fisheries can actually benefit existing game fish. For instance, tiger muskies mixed into a population of rainbow trout and white suckers will often eat only the suckers, allowing the rainbow population to flourish.

But new FWP introductions haven't always gone as planned. Mysis shrimp introduced to Swan and Whitefish Lakes in 1981 drifted into Flathead Lake and contributed to the collapse of the kokanee salmon fishery there in the late 1980s. And many other official stockings of bass, panfish, and other nonnatives have been flops.

Today, biologists plant fish under strict biological guidelines. No legal introduction is made without a complete assessment of how the stocking could affect the lake environment.

Just as biologists now know better, so do anglers. It's no secret that unauthorized fish

Freelance writer David Madison lives in Whitefish.

JAN FINGER/REDPINE

HUNGRY NEWCOMER: Superb sport fish known for their delectable white meat, walleyes can quickly eat up existing forage fish when dumped in some waters. The predators then turn their attention to rainbow trout and other existing sport fish species.

stocking is illegal. In fact, so serious do state lawmakers consider the offense that the 1997 Montana legislature increased the fine to $5,000 and tacked on the potential for one month's jail time and the loss of fishing privileges.

OUTLAW STOCKING CONTINUES

The steep penalties notwithstanding, anglers' affection for illegally planted fish is clearly on the rise. At Bootjack Lake near Whitefish, FWP has seen repeat infestations of pumpkinseeds. Vashro first discovered the sunfish there in 1995 while fly-fishing from a float tube. Earlier in the year, he had noticed less-than-usual insect life at the lake. After catching the pumpkinseed, he immediately suspected the sunfish were eating into the trout's food supply—a hunch that was bolstered later that day when he finally landed a trout. The skinny rainbow looked nothing like the chunky trout that had previously made Bootjack Lake popular.

The trophy trout water was treated in 1996 to get rid of the illegally planted sunfish. A trout population was successfully reestablished, but in 2002, after five years of not appearing in ongoing FWP fish surveys, the pumpkinseeds reappeared.

"That tells us somebody went to work with a bucket," says Vashro.

Why bucket biologists ignore the obvious pattern of their illegal handiwork remains a puzzle to Vashro. At Carpenter Lake near Eureka, bluegills suddenly appeared in 1984. By the early 1990s, the average fish had shrunk to the size of a playing card and were removed at a cost of $80,000. Subsequently, the lake's use greatly increased as anglers flocked to the lake to fish for good-sized trout.

But now, just as in Bootjack Lake, the illegally planted species is back. Soon, predicts Vashro, Carpenter Lake will once again be overrun by stunted bluegills. "For some reason, bucket biologists think history won't repeat itself," he says.

Though the northwest has documented the most unauthorized fish introductions, the problem isn't limited to that region. Vashro ticks off a list of lakes across the state where illegal stocking has damaged existing fisheries, mostly for trout.

"Buffalo Wallow Reservoir near Lewistown, Ross Reservoir in Blaine County, Gartside Reservoir near Sidney—the list goes on and on," he says, "and the expense goes on and on."

Vashro's biggest concern now is the rapidly growing popularity of walleyes and black crappies in northwestern Montana. So far, the FWP Commission has not authorized walleye stocking west of the Continental Divide for fear the warmwater species will compete with—and consume—bull trout and westslope cutthroat trout. But the demand for the nonnative species continues to grow.

The fishing organization Walleyes Unlimited of Montana is officially "deadset against bucket biology," says Frank Danner of Kalispell, an official with WUM. Danner says the group, which has established a chapter in the Flathead area, prefers to work with FWP directly on trying to find ways to get walleyes into the region legally. "We want to be upfront and proud about it," he says. "We don't want to go sneaking around."

Still, however, somebody is sneaking walleyes into state waters. Recently, FWP fisheries crews have discovered the glassy-eyed species in Noxon Reservoir, an impoundment of the Clark Fork River near the Idaho border that's home to struggling populations of native cutthroat and bull trout. And FWP has found illegal walleye plants in seven other waters in western Montana, including Lake Five near Glacier National Park.

Meanwhile, the department has also noted with concern the appearance of black crappies in Blanchard Lake, between Kalispell and Whitefish. FWP is now considering two remedies for the illegal fish in that water and Lake Five. The most expensive option is to treat and then restock the lakes. The other alternative is to close both waters to fishing.

"I'm watching both lakes very carefully," says Vashro, who worries the walleyes and black crappies will travel the same route as illegally stocked northern pike, perch, pumpkinseeds, black bullheads, bluegills, and bass. Each time one of these species established a small population in one lake or pond, it was then moved by buckets to nearby waters. Illegal introductions breed more illegal introductions, and they can quickly disrupt the fishing in lakes and ponds across Montana

"In my opinion, this is an even bigger problem than whirling disease, which is only specific to trout," says Vashro. "The effects of illegal intros are permanent, can be just as devastating, and can strike any fishery in the state."

"FOR SOME REASON, BUCKET BIOLOGISTS DON'T THINK HISTORY WILL REPEAT ITSELF."

JIM VASHRO
FWP Northwest Region Fisheries Manager

A State UNDER SIEGE

Aquatic nuisance species are poised to invade Montana from every direction. What the state is doing to keep them at bay.

BY BERNIE KUNTZ AND TOM DICKSON

It was a scene Jay Stafford hopes to never see again. In early June 2002, the Colorado Department of Wildlife fisheries biologist was called out to Prewitt Reservoir, a popular 2,500-acre fishing lake in that state's northeastern region. Anglers were reporting dead walleyes, sauger, and other fish washing up on shore.

"By the time I got there, it appeared to be a complete fish kill," says Stafford. "There were windrows of dead fish as far as the eye could see, 20 to 30 feet wide."

The culprit was a deadly organism called golden algae. First identified in Israel, it showed up in 2000 in Texas, where it has damaged fisheries throughout the state. In Iowa, where it has since spread, golden algae has wiped out entire fish populations. The algae secretes a potent neurotoxin that quickly enters the bloodstream of fish to cause asphyxiation. No one is sure how it spreads, though boat bilges, bait buckets, livewells, and bird plumage are all suspects.

Golden algae is one of several dozen dangerous aquatic nuisance species now threatening western states. From Washington to New Mexico, federal, state, and local fisheries officials are scrambling to prevent these biological pollutants—already rampant in much of the South, East, and Midwest—from reaching or further infesting western waters. The biggest threats to Montana are the zebra mussel, now causing millions of dollars of damage each year in other states; the New Zealand mudsnail, which blankets riverbeds and threatens trout fisheries; and Eurasian watermilfoil, which covers shallow bays and lakes with thick vegetation mats, rendering them unfit for swimming and boating.

Just as alarming as their threat to industry and recreation, these harmful foreign organisms permanently damage natural areas by displacing native species and lessening biological diversity. Large ecosystems may be permanently altered by a single species. Some may even suffer what scientists are calling an "invasional meltdown," in which each successive invader appears to make success by another all the more likely.

As the world shrinks and more and more people travel, aquatic nuisance species come along for the ride, clinging to boats, propellers, and wading boots and surviving for weeks in bait buckets and livewells. With the Lewis and Clark Expedition bicentennial fast approaching, officials in Montana and elsewhere in the West are taking steps to ensure the influx of tourists retracing the explorers' steps don't unwittingly transport foreign plants and animals into waters here.

BALLAST BORNE

Aquatic nuisance species are nonnative plants or animals that take over lakes and rivers and damage ecosystems, recreation, and the commercial use of waters. Many reach North America

LIQUID CLOGGER: Hydrilla, an exotic plant spreading west from southern states, clogs irrigation ditches and swimming and boating areas.

USDA APHIS NORTH CAROLINA ARCHIVES

Montana's least wanted

Biological pollutants can devastate fish populations, ruin swimming and boating areas, damage industrial and recreational equipment, and irrevocably harm natural ecosystems.

Here are the top seven aquatic nuisance species that state officials and conservationists fear will either enter the state or spread widely within Montana's borders:

WHIRLING DISEASE

WHIRLING DISEASE FOUNDATION

Problem: Reduces trout populations.

ID: Yearling trout with bent spines.

ZEBRA MUSSEL

USGS

Problem: Clogs water pipes, disrupts lake ecosystems, ruins boat engines.

ID: A small D-shaped clam with dark "zebra" stripes. Attaches to underwater surfaces.

NEW ZEALAND MUDSNAIL

MINNESOTA SEA GRANT

Problem: Covers stream and river bottoms, crowding out aquatic insects.

ID: A tiny water snail ranging in size from a grain of sand to ⅛ inch long.

HYDRILLA

USDA ARS ARCHIVES

Problem: Clogs irrigation canals, interferes with swimming and boating.

ID: A long, sinewy underwater plant with tiny white flowers that grow on long, thin stalks that poke up from the water surface.

EURASIAN WATERMILFOIL

ROBERT L. JOHNSON CORNELL UNIVERSITY

Problem: Floating mats displace native vegetation and interfere with boating.

ID: An aquatic plant that grows near the surface. Upper portion often turns reddish. Stems near surface form a dense mat.

ASIAN CARPS

USDA APHIS NORTH CAROLINA ARCHIVES

Problem: These four carp species (bighead, black, grass, and silver) displace native fish.

ID: Unlike common carp, these new species lack barbells.

SPINY WATER FLEA

MINNESOTA SEA GRANT

Problem: Causes declines in native zooplankton and disrupts fisheries.

ID: Tiny organisms that form gelatinous globs on fishing line knots.

from other continents in the ballast water of sea-going ships. Once here, they spread by way of recreational boats, wading boots, and the aquarium and gardening trade. With no natural predators, the newcomers often spread quickly and muscle out native fish and plant species.

Enemy number one for Montana is the zebra mussel. The striped, thumbnail-sized species was first discovered in the Great Lakes in the 1980s, having been inadvertently introduced through ballast water released there by ships returning from Europe. Zebra mussels have since spread into most eastern river systems and are moving steadily west. The aggressive mussel reduces food and oxygen for native species and completely covers native mussels, clams, and snails. In dense colonies of up to 700,000 individuals per square meter, zebra mussels also coat the hulls and engines of boats, causing internal damage and requiring costly cleanup.

Zebra mussels are a particular threat to industry. The species clogs water intake pipes and disrupts water purification and electrical plants. PPL-Montana, which owns and operates a dozen hydropower facilities in the state, is particularly concerned about the threat zebra mussels pose.

"They can cause a lot of operational problems, get into plant systems, and cause major downtime," says Frank Pickett, a PPL-Montana aquatic biologist.

Another potential threat is Eurasian watermilfoil, an aquatic plant that spreads rapidly and clogs swimming and boating areas. Milfoil forms thick underwater stands of tangled stems and vast mats of vegetation at the water surface. The species is now just a few miles from the Montana border, in Idaho's Hayden Lake. FWP fisheries staff fear what could happen if the aggressive water weed crosses the border.

"It could establish in shallow bays on Flathead Lake, the valley floor lakes in Libby, and the Thompson chain of lakes in the Flathead Valley," says John Wachsmuth, fisheries technician. "That could definitely affect property values on those lakes."

Milfoil reproduces by a process called

Bernie Kuntz is an FWP information officer at Bozeman. Tom Dickson is editor of Montana Outdoors.

fragmentation. The plants easily break into small pieces, and each piece can form roots. In one year, a single stem fragment can multiply into 250 million new plants.

Already damaging Montana waters is the New Zealand mudsnail. The mudsnail first showed up in Montana in 1995 in the Madison River, after being identified the previous year in Yellowstone National Park. In the park, the water snails have rapidly spread to the Firehole and Gibbon Rivers, and in Montana they have since been found in the Yellowstone (1996) and Missouri (2000). Pat Clancy, an FWP fisheries biologist at Ennis, says Madison River infestations upstream of Hebgen Reservoir are now as high as 300,000 individual snails per square meter.

Mudsnails pose a threat to Montana's aquatic ecosystems because they have no predators and are phenomenally productive. Like weeds in a garden, they can take over a river bottom, crowding out mayfly nymphs, caddis pupae, and other native river invertebrates. Reproduction is rapid because New Zealand mudsnails clone themselves.

"Our biggest fear," says Tina Proctor, Rocky Mountain regional ANS coordinator for the U.S. Fish and Wildlife Service, "is that the mudsnail will soon begin to affect trout and other fish species."

This tiny pest—its shell length is only ⅛ inch long—feeds mainly on algae, also the food source of mayfly nymphs and caddis pupae. But the snail's fertility allows it to outcompete the native invertebrates. In some Yellowstone National Park river sections, the mudsnail now comprises up to 90 percent of the invertebrate biomass.

"That news is particularly worrisome for those of us watching the Missouri and other rivers that already have a low diversity of aquatic insects," says Travis Horton, FWP fisheries biologist at Great Falls.

It gets worse. The little invaders provide little nutritional value for fish. By closing a "trap door" in their shell, mudsnails can pass through trout and bird digestive tracts unharmed.

Another ANS well-entrenched in many Montana waters is the invasive microscopic parasite responsible for whirling disease. The parasite primarily infects small trout soon after they hatch in a stream and consumes cartilage, causing severe deformities in the head and vertebral column. When severely infected fish try to flee predators, the spinal deformity causes them to swim in a "whirling" fashion. The mortality rate of highly infected young trout can be as high as 95 percent. This tiny parasite, which scientists have named *Myxobolus cerebralis*, was accidentally imported in the 1950s from Europe, where it is native. Within the United States, whirling disease has been transported in the mud of anglers' waders, by boats and trailers, and even in the feces of birds.

The most severe infestations in Montana were in the Madison River during the mid-1990s, causing rainbow trout populations to decline by 80 percent. It has since been discovered in more than 100 Montana wild trout rivers, including the Beaverhead, Big Hole, Blackfoot, Clark Fork, and Smith. In recent years, the disease has also severely infected a major spawning tributary of the upper Missouri.

"The parasite probably never will be eradicated from our wild trout waters, and we will have to find ways to live with the disease," says Dick Vincent, who coordinates whirling disease research for FWP.

MINNESOTA SEA GRANT

MUSCLING OUT THE COMPETITION: Zebra mussels can completely cover and kill native mussels. The fast-spreading species can also cover boat hulls and engines, clog industry water intake pipes, and litter swimming beaches with their sharp shells.

Heading soon to a lake, stream, or river near you

Most aquatic nuisance species came to the East Coast or Great Lakes from Europe or Asia in the ballast water of ocean-going ships. They have since spread west, carried by boaters, anglers, and garden supply stores. So far, Montana has escaped some of the worst infestations.

SOURCES: U.S. FISH AND WILDLIFE SERVICE; U.S. GEOLOGICAL SURVEY

MONTANA OUTDOORS

Another threat are the several species of invasive Asian carp moving ever closer to Montana waters. The bighead carp has moved up the Mississippi River into the lower Missouri River in South Dakota. Filter feeders, the aggressive and productive bigheads outcompete paddlefish and other species that live on zooplankton. Eventually, these and other carp species can completely dominate a fishery. A fish kill on the Mississippi River in 2000 showed that 97 percent of the fish biomass consisted of bigmouth, silver, and black carp.

And the list continues: The spiny waterflea, round-nosed goby, purple loosestrife, hydrilla, and dozens of other species are spreading within Montana or have the potential to cross the border and begin infestations.

Tim Gallagher, who currently leads FWP's efforts to manage aquatic nuisance species, compares the harmful water invaders to termites in a wooden house. "They are busy working away below the surface, doing their destructive thing," he says. "By the time we realize they are there, it can be too late."

WHAT'S BEING DONE

Preventing new infestations is the primary goal of a new state aquatic nuisance species state management plan. Written by an advisory committee representing anglers, industry, landowners, agencies, and other interests, the plan will help FWP and other state and federal agencies lessen the ecological, economic, and social damage of nuisance species. Having a plan in place also qualifies Montana for federal grants.

The state's top concern is to keep new species out of Montana. According to one of the nation's top experts in nuisance species control, that's a smart strategy.

"Once they get into your state, they're pretty much impossible to eliminate," says Jay Rendall, Exotic Species Control Program coordinator for the Minnesota Department of Natural Resources. "Once they're in, about all you can do is work on containment."

Which is why Montana is focusing attention on the zebra mussel, Eurasian watermilfoil, hydrilla, and a handful of other potential eco-invaders not yet detected in Treasure State waters.

The next level of concern are those species now in Montana that have a high potential to spread, such as the New Zealand mudsnail, whirling disease, and purple loosestrife. Though it's not possible to totally eradicate mudsnails and other invaders that have gained a foothold here, some species can be controlled with chemicals or by altering habitat. And biological controls have been shown to work in other states, such as beetles imported from Europe to devour invasive purple loosestrife choking Midwestern wetlands.

Though Montana's aquatic nuisance species plan is relatively new, much work has already begun. More than a dozen fed-

NZ MUDSNAIL BY FEDERATION OF FLY FISHERS/WWW.FEDFLYFISHERS.ORG

> "Our biggest fear is that the New Zealand mudsnail will soon begin to affect trout and other fish species."
>
> —Tina Proctor, *U.S. Fish and Wildlife Service*

ROBERT L. HANSON/CORNELL UNIVERSITY

KEEP OUT: Officials worry most about aquatic nuisance species (such as Eurasian watermilfoil, left) that haven't yet crossed Montana's borders. "It's far less expensive to prevent introductions into your state than to try to do control afterwards," warns one Minnesota expert. Case in point: whirling disease, which infects young trout (bottom) and so far has been discovered in 100 Montana waters. Visitors following the Lewis and Clark Trail (far right) in 2004–05 could accidentally carry even more nuisance species into the West from infected states.

WHIRLING DISEASE FOUNDATION

eral and state agencies and private nonprofits, from the U.S. Army Corps of Engineers to the Montana Native Plant Society, are coordinating knowledge and plans to help reduce the threat. One example is the development of a rapid response plan, which, like those for wildfires and earthquakes, would coordinate efforts among agencies, Indian tribes, businesses, and citizens' groups if an infestation broke out. FWP, Montana State University, and other state organizations are also now assessing the presence of aquatic nuisance species in Montana, identifying potential pathways and high-risk waters, conducting surveys, and increasing research. FWP constantly monitors fish populations, which helps biologists spot new infestations, and the agency will soon hire a full-time coordinator to manage its statewide aquatic nuisance species prevention and control activities.

Public agencies can't do it alone, however. Invasive species can arrive and spread in countless ways, from boats arriving from other states and garden centers that sell species such as purple loosestrife, to fish farms and private ponds.

"Montana only has a handful of biologists to manage this issue, and it's just not enough," says Gallagher. "We definitely need the public's help."

In an effort to involve citizens, FWP will soon begin recruiting volunteers to monitor lakes and streams for aquatic nuisance species. "We want it to be like the Adopt-a-Highway Program that keeps highways clean," Gallagher says. "Only this would be to keep Montana's waters clean."

To spread the word, FWP and other organizations have begun printing signs, posters, and brochures alerting citizens and visitors about the threat posed by biological invaders. A new sign on U.S. Highway 2 urges drivers arriving from Idaho to tune into radio station 1600, where they will hear about aquatic nuisance species and how to avoid spreading the invaders. FWP is setting up more of these traveler information systems along U.S. Highway 191 from West Yellowstone, U.S. Highway 2 on the North Dakota border, and I-94 at Wibaux.

While Montana encourages tourists to visit, some officials say they are worried about the arrival of biological invaders inadvertently carried by visitors tracing the Lewis and Clark Trail in 2004 and 2005. Tens of thousands of boaters are expected to retrace the explorers' journey west, and the fear is that many of those craft will unintentionally carry zebra mussels and other harmful exotic species.

"We are real concerned about the amount of aquatic nuisance species coming into the West from eastern states," says Proctor.

Getting travelers to change their behavior (see sidebar, right) will be key to combating the spread of aquatic nuisance species.

Bob Wiltshire, director of conservation programs for the Livingston-based Federation of Fly Fishermen, thinks it's possible. Having followed the nuisance species issue for years in Montana and other states, Wiltshire believes that once people become accustomed to removing plants and mud from their gear before leaving a lake or river, or washing equipment when they get home, it will become second nature.

"It's like with efforts to end littering," Wiltshire says. "Twenty years ago, the average angler would think nothing of leaving a worm container or fishing line on the bank, but today you almost never see that. People just don't litter much anymore, and our hope is that soon they won't spread aquatic nuisance species, either."

MONTANA OUTDOORS

MINNESOTA SEA GRANT

BLAST 'EM: The best way for boaters to avoid spreading aquatic nuisance species is to wash their equipment with hot, pressurized water after each trip.

STOPPING THE SPREAD

Don't carry aquatic hitchhikers

Always drain water from equipment (boat, motor, livewell, bilge, and transom wells) and remove all visible plants, mud, and animals from your boat, trailer, and other boating equipment before leaving any lake or river.

Clean your equipment

Clean and dry anything (boat, equipment, clothing, waders, dogs, etc.) that came into contact with water before transporting it to another lake or river. Rinse with hot tap water, spray with high-pressure water such as at a car wash, or dry for five days.

Don't biologically pollute

Never release plants, fish, or animals into a lake or river unless they came out of that same lake or river.

Keep your eyes open

Learn to recognize nuisance species. Look for them in waters where you fish, boat, or hike. If you see one, call Montana FWP at (406) 444-2449.

Spread the word (not the pest)

Start talking about aquatic nuisance species. Discuss the problem and solutions with friends and fellow members of fishing and conservation groups.

STATE PARKS 2003 EVENTS CALENDAR

JULY

1, 2, 3 Discover Travelers' Rest, *Travelers' Rest State Park, all day.* Celebrate the Corps of Discovery's return visit to the site in 1806. (406) 273-4253.

1, 8, 15, 22, 29 Discovery Days, *Spring Meadow Lake State Park, 7 p.m.–8:30 p.m.* Presentations on history, nature, and other topics. (406) 495-3270.

3,10,17, 24, 31 Giant Springs Interpretive Series, *Giant Springs State Park, 7–8:30 p.m.* History, nature, and other fascinating topics. (406) 454-5858.

3,10,17, 24, 31 Thursday Night Theories, *Travelers' Rest State Park, 7 p.m.* Presentations about wildlife, Lewis and Clark, and more. (406) 273-4253.

4 Montana's Reptiles and Amphibians, *Lewis and Clark Caverns State Park, 8 p.m.* Learn about the strange habits of frogs, lizards, turtles, and snakes. (406) 287-3541.

5, 12 American Indian Lifestyle, *Missouri Headwaters State Park, 7–8 p.m.* A lively presentation on traditional games, tools, weapons, and native plant use. (406) 994-6934.

5, 12, 19, 26 Saturday Programs, *Bannack State Park, 7–8 p.m.* Entertainment ranging from bluegrass music to history presentations. (406) 834-3413.

5, 12, 19, 26 Campfire Talks, *Black Sandy State Park, 7–8:30 p.m.* Natural history topics. (406) 495-3270.

6 Spring Meadow Lake Triathlon, *Spring Meadow Lake State Park, all day.* Swim, bike, run, collapse. (406) 449-7644.

10–13 Traditional Brain Tanning, *Ulm Pishkun State Park, 1 p.m.* Learn the traditional Indian technique of tanning hides. (406) 866-2217.

11 Placer Mining in Montana, *Lewis and Clark Caverns State Park, 8 p.m.* How early miners found gold. (406) 287-3541.

Bannack Days, Bannack State Park
For two days, this state park ghost town comes alive with shootouts, wagon rides, melodramas, and more. Great family fun. (406) 834-3413.
JULY
19, 20
DONNIE SEXTON/TRAVEL MONTANA

12 Cardboard Cup Regatta, *Spring Meadow Lake State Park, all day.* 6th annual cardboard boat race. (406) 495-3270.

18 History of the CCC at the Caverns, *Lewis and Clark Caverns State Park, 8 p.m.* How the Civilian Conservation Corps built this park. (406) 287-3541.

19 Jordan Ladies Walleye Tournament, *Hell Creek State Park, all day.* (406) 232-0926.

19 Badlands Shoot, *Makoshika State Park, all day.* Watch expert archers nail targets. (406) 687-3412.

19 Bicycle Hill Climb, *Pictograph Cave State Park, 5:30 p.m.* Big Sky State Games competition. (406) 247-2955.

19 Stories of a Painted Teepee, *Missouri Headwaters State Park, 7 p.m.* Lifestyles of the Plains Indian tribes. (406) 994-6934.

19, 20 Big Sky Thunderbirds, *Frenchtown Pond State Park, all day.* Radio-controlled airplane demonstration. (406) 542-5531.

19, 26 Crow Life Ways Series, *Chief Plenty Coups State Park, 1:30 p.m.* Traditional Indian culture and customs. (406) 252-1289.

20 Makoshika 50th Anniversary Celebration, *Makoshika State Park, all day.* (406) 377-6256.

20 Big Sky Games Triathlon, *Lake Elmo State Park, 5 a.m.–12 p.m.* (406) 247-2955.

25 Hell Creek Walleye Fishing Tournament, *Hell Creek State Park, all day.* (406) 232-0926.

25 The Shape of Montana, *Lewis and Clark Caverns State Park, 8 p.m.* How Montana's boundaries came about. (406) 287-3541.

26 Fort Owen Day, *Fort Owen State Park, all day.* Living history program. (406) 542-5531.

26 Lewis & Clark Expedition, *Missouri Headwaters State Park, 7 p.m.* (406) 994-6934.

AUGUST

1 River Quest of Lewis and Clark, *Lewis and Clark Caverns State Park, 8 p.m.* Missouri River history. (406) 287-3541.

1, 2, 3 Native American Art Show, *Ulm Pishkun State Park, all day.* Traditional and contemporary works. (406) 866-2217.

2 Kid's Fishing Tournament, *Hell Creek State Park.* (406) 232-0926.

2 Corks of Discovery, *Lewis and Clark Caverns State Park, 8:30 a.m.* Float the Jefferson River with park staff. (406) 287-3541.

2 Summer Speakers, *Missouri Headwaters State Park, 7 p.m.* History and wildlife habitat topics. (406) 994-6934.

2, 9,16, 23 Bannack Programs *Bannack State Park, 2 p.m.* Lectures, music, presentations. (406) 834-3413.

2, 9,16, 23, 30 Campfire Talks, *Black Sandy State Park, 7–8:30 p.m.* Natural history. (406) 495-3270.

2, 23 Crow Life Ways Series, *Chief Plenty Coups State Park, 1:30 p.m.* Traditional Indian culture and customs. (406) 252-1289.

5,12,19, 26 Discovery Days, *Spring Meadow Lake State Park, 7–8:30 p.m.* History, nature, and other topics. (406) 495-3270.

7, 14 Giant Springs Interpretive Series, *Giant Springs State Park, 7–8:30 p.m.* History, nature, and other topics. (406) 454-5858.

7, 14, 21, 28 Thursday Night Theories, *Travelers' Rest State Park, 7 p.m.* Presentations on wildlife, Lolo Trail, and more. (406) 273-4253.

8 Brother Can You Spare A Dime? *Lewis and Clark Caverns State Park, 8 p.m.* Folk songs of Montana history. (406) 287-3541.

9 Concert, *Ulm Pishkun State Park, all day.* Jack Gladstone, Blackfeet singer-songwriter. (406) 866-2217.

15 Dutch Oven Cooking, *Lewis and Clark Caverns State Park, 7 p.m.* Making meals without the George Foreman appliances. (406) 287-3541.

15, 16 Theater in the Park, *Makoshika State Park,* 7 p.m. Melodrama set in the park's spectacular badlands. (406) 377-6256.

22 Tales of the Fur Trade, *Lewis and Clark Caverns State Park, 8 p.m.* (406) 287-3541

29 The History of Farming and Ranching, *Lewis and Clark Caverns State Park, 8 p.m.* (406) 287-3541.

30 Day of Honor, *Chief Plenty Coups State Park, 12–8 p.m.* Celebration of Crow elders, with a buffalo feast at 3 p.m. (406) 252-1289.

30 Star Gazing, *Bannack State Park, 8 p.m.* Beyond the Big Dipper. (406) 834-3413.

Long-toed Salamander
(Ambystoma macrodactylum)

DONALD M. JONES

THOUGH RARELY SEEN above ground during the day, the long-toed salamander is western Montana's most common salamander. These amphibians live in every county west of the Continental Divide and in the drainage headwaters just east of the divide. The long-toed salamander found in Montana is the northern subspecies, known as *krausei*, and is also found in Idaho, southeastern British Columbia, and southwestern Alberta.

APPEARANCE: The adult long-toed salamander is 3 to 4 inches long. Its slender body is colored dark gray-green to black and sports an irregular green or yellowish stripe along the middle of the back. Scattered on the sides and belly are bluish-white speckles. The salamander is named for a toe on the back foot that is noticeably longer than the others. The larvae are aquatic, tan to black, less than 2 inches long, and have three pairs of external gills extending from the base of the head.

HABITAT: Long-toed salamanders live in moist habitats, from timbered valley floors to alpine meadows and alpine lake shorelines. They are usually found near a pond, lake, or stream, often under logs. Adults are dormant during winter and emerge from ground or log burrows in early spring. Active mostly at night, they travel to temporary or permanent ponds right after the snow melts to breed. Once they have bred, these amphibians move to upland areas.

FOOD: Adult long-toed salamanders eat a variety of invertebrates, including slugs, worms, and insects. Smaller larvae eat tiny water crustaceans (zooplankton), but as they grow they eat invertebrates, frog tadpoles, and often other smaller salamander larvae.

REPRODUCTION: Long-toed salamanders breed earlier in spring than any other Montana amphibian. The males usually reach breeding ponds a few weeks earlier than females. Migration routes to the ponds can be as long as one-third of a mile, an extraordinary overland distance for such a small animal.

The salamander's mating ritual begins when the male approaches the female in the water, rubs his chin on her nose, and then moves away. A gland on the male's chin secretes an aphrodisiac chemical that induces the female to mate. If the female is receptive, she follows the male while keeping her snout to his tail.

The male fertilizes the female's eggs without actually copulating. He chooses a site and deposits a gelatinous sac containing sperm. The female moves over this spermatophore and draws it into her cloaca. After the eggs have been internally fertilized, the female lays them in clusters of 20 or so underwater on rocks, sticks, or stalks of vegetation. Larvae emerge from the eggs in a few weeks, and then grow for up to a year or more before metamorphosing into adults. Adults mature at age two to three and can live up to seven years or more.

ECOLOGY AND STATUS: Like all amphibians, the long-toed salamander absorbs water and oxygen through its skin and lives on land and water at various stages of its life. Because of their sensitivity to changes in their habitats, long-toed salamanders serve as early indicators of environmental problems.

Though removal of forest cover can reduce salamander numbers, long-toed salamander populations still appear secure in western Montana. "We find them in about two-thirds of the watersheds and water bodies we survey," says Bryce Maxell, a University of Montana research scientist.

VIEWING: Because they are common, long-toed salamanders are easy to find if you know where to look. The best spots are under logs in moist areas along ponds or temporary wetlands in spring, after snowmelt. Look for the yellow stripe on the salamander's back. Kids love to search for salamanders and handle them once found. Because these amphibians have a permeable skin, they can be harmed by over-handling or exposure to chemicals, perfumes, or other foreign substances. Some kids keep long-toed salamanders for a time in terrariums. Maxell says these pets should not be released back into the outdoors, to avoid introducing diseases they may have contracted in captivity to wild populations.

JOHN FRALEY

BY JOHN FRALEY
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WATCH YOUR BACK

To a trout, the salmonfly is a double bacon cheeseburger with wings. In early summer, normally wary browns, rainbows, and cutthroats throw caution to the wind and rush up to the water's surface to engulf the floating, fluttering morsels. Apparently the high caloric content of the 2½-inch-long insect makes it worth the risk, even for the most reclusive (biggest) fish. So aggressive do some trout get during the hatch they will leap from the water to pull a salmonfly down from a low tree branch or streamside rock.

Trout showing such abandon are a fly angler's dream. During the salmonfly hatch, the Madison, Big Hole, and other western Montana rivers can be bank-to-bank drift boats. Anglers fling bulky, thumb-sized imitations with names like Sofa Pillow and Orange Stimulator. Unlike most fly fishing, the sloppiest cast often does the best job of mimicking the awkward salmonfly, which alights on the water with the grace of a tossed melon. Photo by Paul E. Updike.

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